

Published every Saturday by the  
**Simmons-Boardman Publishing  
 Company, 1309 Noble Street,  
 Philadelphia, Pa., with editorial  
 and executive offices: 30 Church  
 Street, New York, N. Y., and 105  
 West Adams Street, Chicago, Ill.**

**SAMUEL O. DUNN, Chairman of Board**  
**HENRY LEE, President**  
**LUCIUS B. SHERMAN, Vice-Pres.**  
**CECIL R. MILLS, Vice-Pres.**  
**ROY V. WRIGHT, Vice-Pres. and Sec.**  
**FREDERICK H. THOMPSON, Vice-Pres.**  
**ELMER T. HOWSON, Vice-Pres.**  
**F. C. KOCH, Vice-Pres.**  
**JOHN T. DEMOTT, Treas.**

**CLEVELAND**  
**Terminal Tower**

**WASHINGTON**  
**832 National Press Building**

#### Editorial Staff

**SAMUEL O. DUNN, Editor**  
**ROY V. WRIGHT, Managing Editor**  
**ELMER T. HOWSON, Western Editor**  
**H. F. LANE, Washington Editor**

**B. B. ADAMS**  
**C. B. PECK**  
**W. S. LACHER**  
**ALFRED G. OEHLER**  
**F. W. KRAEGER**  
**E. L. WOODWARD**  
**J. G. LYNE**  
**J. H. DUNN**  
**D. A. STEEL**  
**R. A. DOSTER**  
**H. C. WILCOX**  
**NEAL D. HOWARD**  
**CHARLES LAYNG**  
**GEORGE E. BCYD**  
**WALTER J. TAFT**  
**M. H. DICK**

*The Railway Age is a member of  
 the Associated Business Papers (A.  
 B. P.) and of the Audit Bureau of  
 Circulations (A. B. C.)*

Subscriptions, including 52 regular  
 weekly issues, payable in advance  
 and postage free; United States and  
 possessions, and Canada, 1 year  
 \$6.00, 2 years \$10.00; foreign coun-  
 tries, 1 year \$8.00, 2 years \$14.00.

Single copies, 25 cents each.

Address **H. E. McCandless, Cir-  
 culation Manager, 30 Church Street,  
 New York, N. Y.**

# Railway Age

With which are incorporated the Railway Review, the Railroad Gazette  
 and the Railway Age-Gazette. Name registered U. S. Patent Office.

Vol. 101

October 10, 1936

No. 15

## In This Issue

### New York Central Completes Grade Separation and Passenger Station Project Within City of Syracuse.....Page 504

A comprehensive description of this track elevation over new 5-mile route, in-  
 cluding 30 bridges and 1,500,000 cu. yd. of embankment.

### Three-Cylinder Locomotives on the London & North Eastern.... 514

Presents descriptions of the 2-6-2 "Green Arrow" and the 2-8-2 "Lord  
 President," two new designs recently developed for high-speed service.

### Management's Four-Fold Task..... 517

M. W. Clement, president of the Pennsylvania, views it as having obligations  
 to labor, to investors, to the public and to itself in the wise selection of future  
 leaders.

## EDITORIALS

Today's Great Opportunity for Far-Sighted Leadership.....	501
Equipment Markets .....	503

## GENERAL ARTICLES

New York Central Completes Grade Separation and Passenger Station Project Within City of Syracuse .....	504
Freight Car Loading.....	513
Three-Cylinder Locomotives on the London & North Eastern.....	514
Chicago "Fan" Excursion Brings out 472 Customers.....	516
Management's Four-Fold Task, by M. W. Clement.....	517
I. C. Starts Employee Training Program.....	518
Labor Conditions in Bus Transport.....	519
Steam Railroad Session at National Safety Council Meeting.....	521
Rock Island to Buy Six Streamlined Trains.....	525

## COMMUNICATIONS ..... 526

## NEWS ..... 528

## REVENUES AND EXPENSES OF RAILWAYS..... 540

*The Railway Age is indexed by the Industrial Arts Index and also by the  
 Engineering Index Service*



## Increase Locomotive Capacity By Use of MODERN STEELS!

For many years any increase in locomotive ton-mile per hour capacity meant a corresponding increase in locomotive weight. » » » Today, modern motive power as compared with power of a few years ago, delivers more than one-third greater capacity with no increase in driving wheel load. » » » In this improved design modern steels have had a major part. » » » Agathon Alloy

Steels for axles, rods, pins and other motion work parts provide greater strength and permit lighter weight sections. » » » Agathon Nickel Iron for case-hardened pins provides a hard, long wearing surface with a tough inner core. » » » Whatever the service there is a Republic Steel to economically meet its needs. Our metallurgists will gladly consult with you. Address Dept. R. A. » » »



# Republic Steel

## C O R P O R A T I O N

ALLOY STEEL DIVISION, MASSILLON, OHIO  
GENERAL OFFICES: CLEVELAND, OHIO

REPUBLIC BOLTS  
NUTS and RIVETS  
and similar shapes  
are made with the  
same care and high  
quality of material  
as are the famous  
Republic rail  
road locomotives.

# Today's Great Opportunity For Far-Sighted Leadership

Years ago the writer of these lines for some months observed the operation of a small railroad shop from the inside. Most of the work was the making of running repairs to cars and locomotives in a busy and important terminal. The master mechanic on this division was a "raw hider" of the old school. The efficiency of his supervisors he judged solely by the ratio of "okays" to man-hours worked. There were then many cars with wooden draft timbers, and broken draft bolts were a constant source of trouble. The character of lading of cars with broken draft bolts made a great difference in the number of man-hours necessary to repair them. If shifting the load to get at the bolts inside the car involved much labor, and there were many such "B.O.'s," the ratio of "okays" to man-hours declined in spite of anything the car foreman could do. But that explanation carried little weight with the master mechanic. If the ratio declined the foreman was roasted with a thoroughness which all who remember the old "raw hiding" school can imagine for themselves.

Since every wrong begets another, the foreman found a way of circumventing the injustice to which he was subjected. If his ratio of "okays" to man-hours was in danger of declining, he inspected every car with broken draft bolts himself, where the load had to be shifted. If the car "would ride," a new bolt head was wedged up into the hole in place of the broken draft bolt so that no inspector would detect a defect—and an "okay" was produced in about 15 minutes. A few such "repairs" as this and the foreman's ratio was brought to a point where he would escape criticism. Bad business for the railroad, of course, but the master mechanic wanted statistics to boast about to the superintendent of motive power—so the foreman had to do his part in providing those statistics, or else . . .

### Corporate Individualism Versus the Economic System

In the enginehouse a similar condition existed. The responsibility for running repairs to locomotives was shared with adjoining terminals. Here again the "okay" ratio to man-hours was used, and each repair job undertaken was done with the thought of doing only enough to get the engine over the road once, with the hope that the heavy jobs would fall to the lot, and against the record, of the other engine terminal. Bad railroading again—but the only hope of preferment, or even survival, of the responsible foreman.

Such practices have been largely eliminated on individual railroads. The lesson of the impracticability of utterly selfish striving within an organization, the success of which depends primarily on teamwork, has been gradually and painfully learned. But the process has been too gradual and too painful, and it has not been completely learned by the railroad industry as a whole, as is shown by many practices intended to further the interests of individual lines at the cost of the industry, which result in more cost to the industry than benefit to the lines responsible for the practices. Such practices, moreover, are not peculiar to the railroads. They permeate all industry.

Almost every industry—especially if it is integrated enough to be quasi-monopolistic—follows policies intended to benefit itself at the expense of other industries, largely regardless of the probable effects on the general welfare. Labor unions follow the example. They seek reductions of the working hours and advances in the hourly wages of their members with little or no consideration of the effects that will be produced upon the prices that will have to be charged for their products; upon the consuming public that will be called upon to pay these prices; or even upon the jobs of the members of the unions if the public proves unwilling or unable to pay the prices asked.

### Making the System as a Whole Function

It is just as fatuous for the automotive industry or the railroads or the steel industry or any other business or the members of labor unions to seek their own profit through monopolistic practices and governmental favoritism, regardless of the effect on the economy as a whole, as it was for the master mechanic, in the instance cited above, to adopt a policy which forced his foremen to produce phoney "okays." Industries have for the most part learned this lesson insofar as their own internal workings are concerned. But they have not learned it to the extent that they will subordinate the immediate selfish interests of their respective industries to that of the national economy as a whole. The very kind of departmental selfishness and lack of teamwork which the business executive deplors and tries to chastise out of his subordinates is, often enough, the identical quality with which he approaches other businesses that are his rivals or customers.

If there is a crying need in America today it is for articulate leaders who will take the trouble to view our



economic situation *as a whole*. Not simply what policies will best subserve the immediate selfish ends of the railroad industry, the automotive industry, the steel industry, organized labor, or the farmers—but rather what balance can be struck among the aspirations of each element in our society which will *insure the optimum functioning of the economic machine as a whole*.

### The Old and New Systems

Under pure competition, as set forth by the classical economists, the following by each individual of his own self-interest did secure the optimum functioning of the economic machine as a whole. But a large part of our economic structure is no longer sufficiently competitive to give validity to this principle. Where competition is modified, as it is largely owing to the size to which many corporations have grown, the pursuit of what seems to be individual self-interest has to be modified too, or controlled, if the entire economic machine is to function efficiently. Corporate ownership of the means of production necessitates teamwork instead of ruthless individualism. The railroads, being the first large corporations, have learned this lesson probably more thoroughly than any of their contemporaries, and that fact gives them the opportunity, and the responsibility, of leading the way in bringing modern industrial policy into line with present-day actualities.

The persistence of narrowly individualistic striving under economic conditions which plainly demand teamwork has brought results bordering dangerously on chaos. Lack of vision of the interdependency of our industries has led them individually to strive for advantages at the expense of others. This policy works all right in an economy of small business units, but when followed in an economic system largely consisting of huge units the whole economic mechanism comes to grief. The automotive and road-building group have enjoyed their hey-day at the expense of the railroads and railroad employees, but a large part of the bill for our highway extravagance still remains to be paid, and, if the users of the highways do not pay it, then the burden will be an old man of the sea on the necks of all taxpayers—which certainly will not conduce to a condition favorable to the sale of automobiles. The exploitation of political favoritism also carries with it the danger of a repercussion, from which the railroads suffered severely, but this is a lesson our automotive friends seem determined to learn from their own experience, rather than profiting from ours.

### New Economic Standards Needed

Every wrong begets other wrongs in its wake. The working rules of employees in train and engine service seem fantastic to an outsider. Yet many of them undoubtedly had their genesis in some sharp practice instituted by some too-clever supervisory officer in the attempt to improve his own statistical record by forcing men to do work which they ought not have been called upon to do without extra pay. The astute supervisor, by improving his statistical showing at the ex-

pense of his men, thus saddled his company and his industry with burdensome rules which afflict it in meeting the competition of newer rivals, the employees of which have not learned the technique of preventing their bosses from overworking them.

Is it not as plain as a pikestaff that what we need is a rejuvenation of standards in our economic life? We have assumed for generations that the pursuit by each individual of his own interest was best for business. That was, with qualifications, true in the day of Adam Smith and John Stuart Mill. But corporate businesses have learned from bitter practical experience that it is not a safe principle to allow full rein *within* the corporation. What they have not yet learned is that, with virtually all business now in corporate form, either (1) *the restraints which pure competition formerly placed on individual greed must now be voluntarily and consciously applied* as sound business principles by corporate managements, or (2) competition will have to be fully restored, or (3) all large incorporated industries will have to submit to some such government regulation as has been applied to railroads and public utilities. What is required to avoid either (2) or (3) is a manifestation by corporate management of the same concern for our economy as a whole as these same managements now require their supervisors and department heads to show toward their business as a whole.

### Free Competition, New Deal — or What?

Pure competition would prevent unemployment, although wages would have to fluctuate under it. Corporate business, if it is to survive without government regulation, must do at least as well. Pure competition maximizes production at all times even at the expense of profit. Corporate enterprise which controls productions and prices to subserve profit to the point where it destroys the power of consumers to buy, defeats its own end. No one knowing human nature can trust too much in its altruism. Hence we should probably go out of our way to foster individual private enterprise, which is self-regulating, as far as possible. But railroads and automobiles and steel and many other businesses require such aggregations of capital that the corporate form is necessary. And where this is so, let there be no question about it, teamwork has got to replace individualism, and individual selfishness must give way to policies that will keep capitalism functioning efficiently or the system will bog down—as it has bogged down since 1929.

The New Deal is mistaken in its approach to this problem. It has attempted to right the unfavorable results of untimely individualism on the part of corporate enterprise by imposing upon it government competition, government subsidies and government regulation, administered by persons who are just as selfishly individualistic as the corporate managements whose course of action they seek to modify. The Interstate Commerce Commissioner with his eye on the approaching expiration of his term is no more able to render decisions in the interest of the country as a whole than the



car foreman mentioned in our opening paragraph was able to repair cars in the interest of the railroad as a whole. The New Deal has proceeded on the assumption that the evils engendered by the short-sighted selfishness of corporate managements can be corrected by imposing upon business the equally short-sighted selfishness of a horde of bureaucrats, who, being for the most part men of meager attainments, are even less likely to see our economy as a whole than the men whose actions they seek to modify or circumvent.

### Morality and Business

Morality and business are popularly supposed to have little in common. But let anyone who thinks so look back on his experience during this depression. How many companies went "in the red" to keep organizations together which, twenty years ago, would have considered such behavior, to say the least, sentimental? Our point is this—that corporate enterprises have found that a higher ethical standard is required in their own businesses, and that, without always recognizing the import of what they were doing, they have put this principle into practice. And furthermore, we believe that the recognition of this principle and the application by business and industrial management to the economy as a whole of ethical principles that have already proved their validity within their own establishments is just about all that is needed to restore prosperous functioning of the economic machine in this country—putting to rout the socialists and New Dealers, who condone mischief by seeking to get their "cut" out of it.

But these principles must be applied to the customers of every industry—that is, the public—in fixing prices as well as to its employees in fixing wages. The commonest and most destructive mistake to which the existence of industries consisting of a few large corporations leads is that of controlling prices almost regardless of their effects upon the markets for their products. Indirectly, the farmers are the largest single market for the products of the industries of this country; but this vitally important fact apparently was almost completely disregarded by most of our large industries in deciding upon their wage and price policies before and during the early years of the present depression. The disastrous political and economic effects of this practical disregard by industrial management of its most important market have been felt for seven years and may be felt for many more years. They afford conclusive evidence of the necessity for leaders of Big Business, as a matter of self-preservation, to consider what will be the long-range effects of their policies upon the entire political and economic system of the country, rather than merely what will be the temporary effects upon their own companies or industries.

There is opportunity for a Washington or a Lincoln now in American economic life which does not fall to every generation. And if such a leader is found, he will probably not arise from the ranks of politicians but rather among the "economic royalists" who direct big business.

## Equipment Markets

Domestic orders reported in September issues of *Railway Age* for 24 locomotives and 3,100 freight cars brought this year's nine-months total purchases in those two categories to nearly double the volume reported for the entire 12 months of 1935. And while no domestic orders for passenger-train cars were reported last month, as was the case also in August, the 1936 purchases of this class of rolling stock were by the end of July equal to twice 1935's 12-months volume. Meanwhile rail buying also continues active, with the September orders for 30,000 tons pushing this year's business still further ahead of that placed throughout 1935.

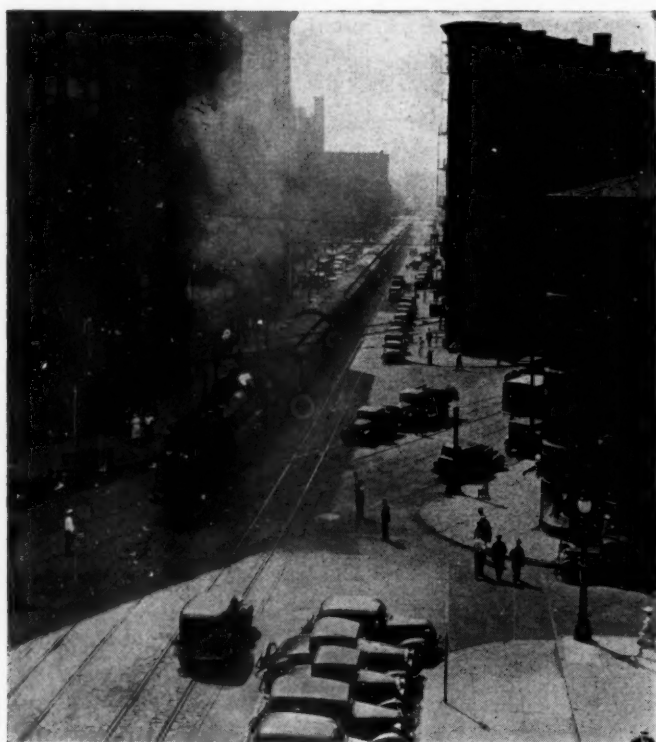
The September orders for 24 locomotives brings this year's total to 158, excluding power units for streamlined trains. This nine-months figure compares with 83 locomotives ordered throughout 1935. Fourteen of the locomotives ordered in September were steam and 10 were Diesels. Thus far in 1936 a total of 122 steam locomotives has been ordered—a figure which equals the combined total of 122 steam locomotives ordered during the four previous years, 1932 to 1935. There were, of course, orders for locomotives other than steam in these four previous years, but in only one of them—1934 with its 183—has the total orders for locomotives of all types exceeded this year's nine-months figure of 158. In addition, there were ordered in September five locomotives for export and there were outstanding on October 1 inquiries for 67 for domestic service and 13 for export; also, plans were pending for the purchase of three others for domestic service.

Thus far in 1936 a total of 37,354 freight cars has been ordered for domestic service. This is but 44 cars short of being double the business of 1935's 12 months when domestic orders for 18,699 freight cars were placed. Furthermore, this year's business in the freight car field, having passed at the half-year the total for the entire 12 months of any year since 1930, is now in nine months equal to 80 per cent of that year's total. Then there are this year's export orders for 516 freight cars, a larger export volume than that reported for the entire 12 months of any year since 1930, save 1934. At the close of last month inquiries were outstanding for 1,300 freight cars for domestic service and 1,100 for export.

The situation in the passenger-train car field, as stated at the outset, remains the same as last month. Thus far in 1936 a total of 141 cars of this type has been ordered, exclusive of articulated units for streamlined trains. This, as pointed out in the *Railway Age* of August 8, is more than twice the 63 passenger-train cars ordered throughout 1935, and is larger than the total for the entire 12 months of any year since 1930, except 1934 when 388 passenger-train cars were ordered. Domestic inquiries for 12 passenger-train cars were outstanding on October 1.

The 30,000 tons of rail ordered in September brings the year's total to date to 552,585 tons—more than 57,000 tons in excess of 1935's total of 495,300 tons.

# New York Central Completes Grade Crossing Elimination Project Within City



Operation Through Washington Street is at an End

**T**HE inauguration of high-level service on September 24 marked the substantial completion of the extensive grade crossing elimination project of the New York Central in Syracuse, N. Y., involving the removal of all main-line train operation from city streets, with the elimination of 62 main-line grade crossings. In addition, the project involved the construction of new passenger station facilities, including a modern passenger station with 10 through passenger station tracks, together with a separate mail and service building, an express building, and a passenger car facilities building.

The key to the plan for the elimination of grade cross-

Track elevation over new 5-mile  
1,500,000 cu. yd. of embankment  
crossings. New passenger fac

ings in Syracuse, which represents one of the largest and most important projects of its kind in recent years, was the abandonment of the double-track passenger main line through Washington street, a main business street of the city, and the consolidation of this line with the double-track main line of the West Shore railroad, a leased line of the Central, into a three-track line which has been elevated through the city over a distance of approximately 5 miles.

The project, which is now substantially complete, has involved approximately 1,500,000 cu. yd. of embankment, the construction of 27 railroad bridges and 3 highway bridges, and the complete signaling of the new main tracks, including three new interlocking stations. The bridges, all of which are of steel, are unusually attractive in appearance. Two of them, designed to meet special conditions, employ long plate girders constructed of nickel steel.

## Operation in Streets a Real Problem

The grade crossing situation within Syracuse, a city of about 210,000 population, has for many years constituted a problem for the railroad and for the city. This was primarily because of the extensive mileage of main-line tracks directly within business streets. The different lines of the road within the city prior to the present project included the double-track passenger main line, the double-track main line of the West Shore railroad, the Syracuse Junction branch, the Watertown branch, the Chenango branch, the Auburn branch, and two shorter



The New Passenger Station, Faced with Brick and Limestone, Fronts on a Wide Boulevard



# Grade Separation and Passenger Station City of Syracuse

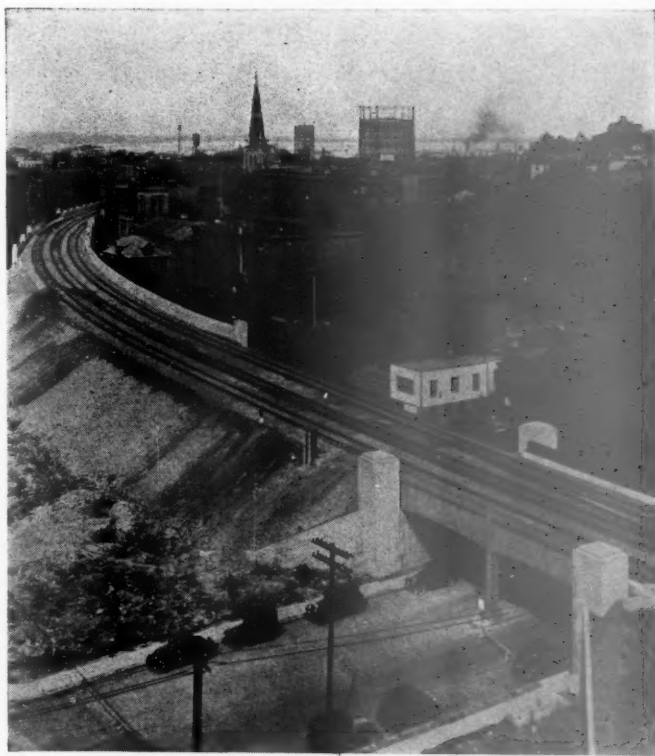
route, involving 30 bridges and  
ment, eliminates 62 main-line  
ilities adequate and attractive

industrial branches, in addition to several yards and a large number of sidings and team tracks.

Until the inauguration of high-level operation through Syracuse, the passenger main line entered the city from the east on its own right-of-way and passed in a general westerly direction through the main business section, occupying Washington street for a distance of approximately 1.4 miles. This line carried all through passenger traffic into and out of the city, in addition to a considerable number of branch-line and local freight movements, involving a total of approximately 100 trains every 24 hours.

In their approach to and location in Washington street, the main line tracks crossed 18 north and south streets at grade, including several of the most important thoroughfares in the city. The old passenger station, a stone-faced structure served by a large train shed, built in 1895, was located at South Franklin street, at the west end of the main line occupation of Washington street. West of the station, the main line, with supporting coach and freight yards, occupied a private right-of-way to the west city limits, but within this territory crossed three additional streets at grade.

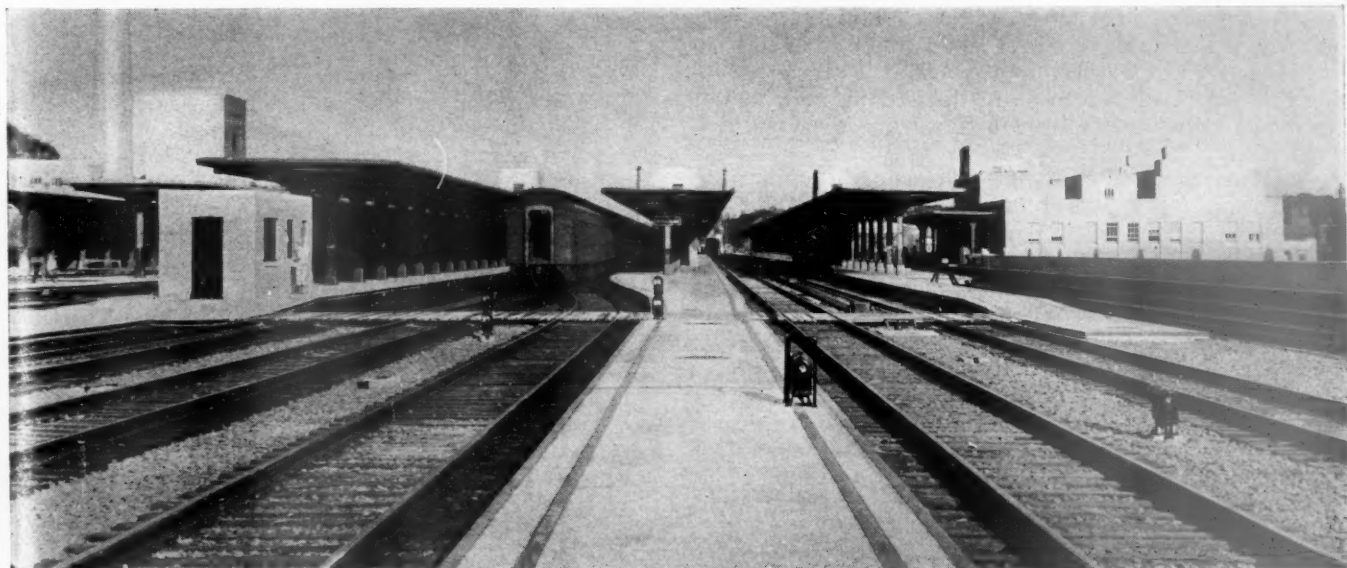
The West Shore main line, occupying its own right-of-way, practically paralleled the main line of the Central about four blocks north. This line, prior to the present track elevation work, crossed 29 streets within a distance of 5 miles. Its most important grade crossings within the heart of the city were at North State, James and North Salina streets, the latter two carrying street car



Looking West Over a Section of the Elevated Tracks

tracks. All through freight of the Central and the West Shore has for a number of years been carried around Syracuse to the north over the Syracuse branch, which extends from the DeWitt classification yard at East Syracuse to the main line at Syracuse Junction, at the west end of the city, a distance of approximately eight miles.

In addition to the main-line grade crossings within Syracuse, branch lines of the Central occupied city streets for several miles and involved a large number of grade crossings. Details of the locations and routes of these



Looking East Toward the Track and Platform Layout at the New Passenger Station



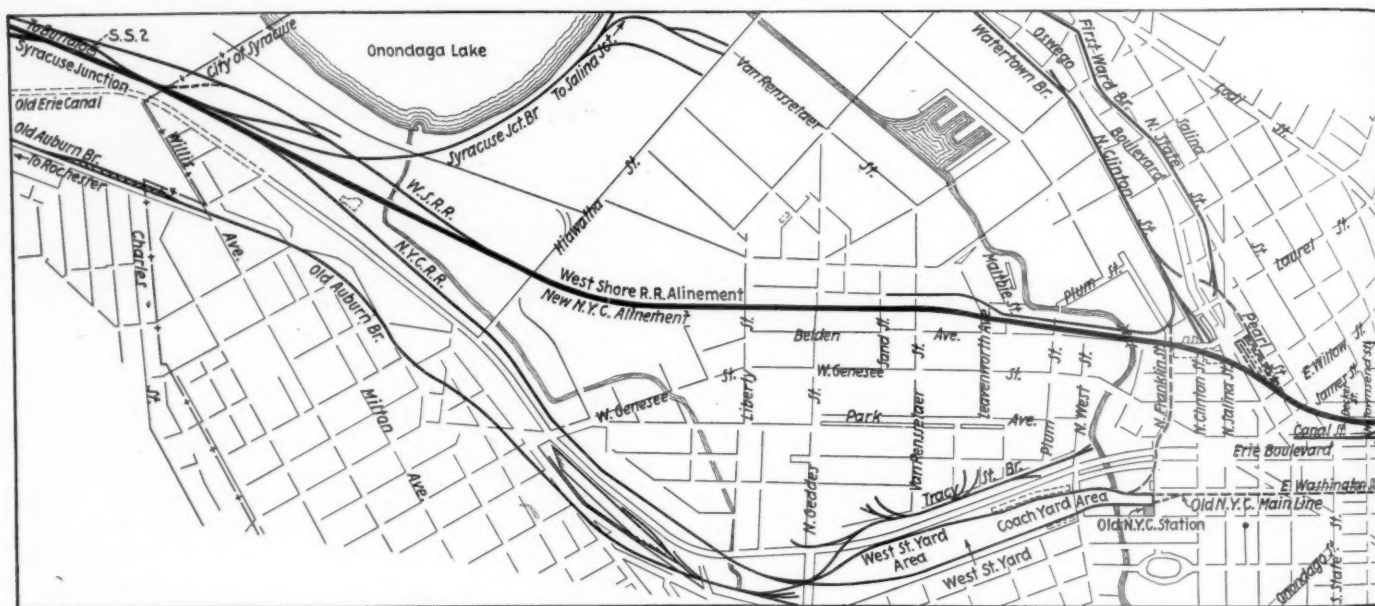
branches and the manner in which they were treated in the grade separation project to eliminate a large amount of the trackage in the streets, and to confine that trackage still in the streets to local industrial switching, were presented in the *Railway Age* of April 23, 1934, at the time the project was getting under way.

### Long, High, Three-Track Embankment

In the changes which have been made, all New York Central traffic which moved through Washington street has now been diverted to the new elevated line through two connections; the easterly one located between Midler avenue and Peat street, and the westerly one west of Hiawatha street. The rise in the track grade at the east end of the work begins at practically the east end of the new east end connection, the initial rise being on a 0.3 per cent grade, which extends through a distance of approximately 3,700 ft. to a point where the elevated tracks are approximately 12 ft. above the old level of the West Shore tracks. Immediately west of this point, the high-

inal West Shore tracks were on a fill for a considerable distance in the west half of the city, the new three-track fill is considerably higher than the difference in track elevations would indicate, reaching a maximum height of about 40 ft. in the vicinity of Liberty street.

Of the 29 streets affected by the track change, all but 5 were at grade. These latter streets passed beneath the West Shore in relatively narrow underpasses. In 1930, one of these streets, Thompson road, was shifted to the west and carried on a viaduct approximately 1,650 ft. long over both the New York Central tracks and the West Shore tracks. At about the same time, a grade crossing at Nichols avenue and the West Shore, in the eastern part of the city, was eliminated by closing it and extending Midler avenue over the tracks on a steel structure. The underpasses carrying the other four streets have since been completely rebuilt. Eighteen of the other streets previously crossed at grade, and one additional street opened, are now spanned by steel bridges supported on concrete abutments, so that there



General Plan of the New York Central and West Shore Tracks Within the City of Syracuse

level tracks continue on a level grade for about 1,600 ft., beyond which, for about 3,000 ft. they drop on a 0.10 per cent grade to the west and then continue on a level grade for a distance of about 2,600 ft. Within this latter stretch of level track, approximately 20 ft. above the level of the former tracks, are located the new station facilities, including 10 through tracks and 5 canopy-covered platforms.

West of the station layout, the main through tracks rise on a 0.15 per cent grade to the west for a distance of about 1,500 ft., and then descend on a 0.3 per cent compensated grade to the level of the existing New York Central main tracks at Syracuse Junction. Curvature on the elevated line was limited to two degrees, except directly within the heart of the city, where, in order to avoid excessive property damage, curvature slightly in excess of three degrees was necessary.

The elevated tracks throughout are supported on earth embankment between streets, with natural side slopes except at certain points where the restricted width of right-of-way made it necessary to construct retaining walls. Through the main portion of the elevation, the tracks are, in general, from 20 to 22 ft. above the present track level, reaching a maximum of approximately 27 ft. in the vicinity of Plum street. Owing to the fact that the orig-

inal West Shore tracks were on a fill for a considerable distance in the west half of the city, the new three-track fill is considerably higher than the difference in track elevations would indicate, reaching a maximum height of about 40 ft. in the vicinity of Liberty street.

### Unusual Grading Methods

The first stage in the project involved the building of the embankment, together with the construction of the bridge abutments and certain retaining walls. This work was begun early in 1934, while all West Shore traffic was diverted to the New York Central tracks in Washington street or over the Syracuse Junction branch. The grading, which involved the placement of approximately 1,500,000 cu. yd. of fill, largely sand and gravel, was handled largely with side-dump cars, draglines and cranes, in some respects in an unusual manner, because of local conditions and to avoid interference with the bridge masonry construction going forward at the same time at so many locations.

All of the filling material was secured from a 62-acre level gravel pit located along the West Shore about 9 miles east of the city, where the contractor, employing three gasoline or Diesel-powered crawler-mounted dragline excavators with 2½- or 3½-yd. buckets, excavated to a depth of approximately 40 ft. below the ground and 25 ft. below water level in the pit. All material was loaded into and transported to the fill in 40- to 50-

car trains of 16-yd. side-dump cars, three such trains being kept in almost constant operation during the working season.

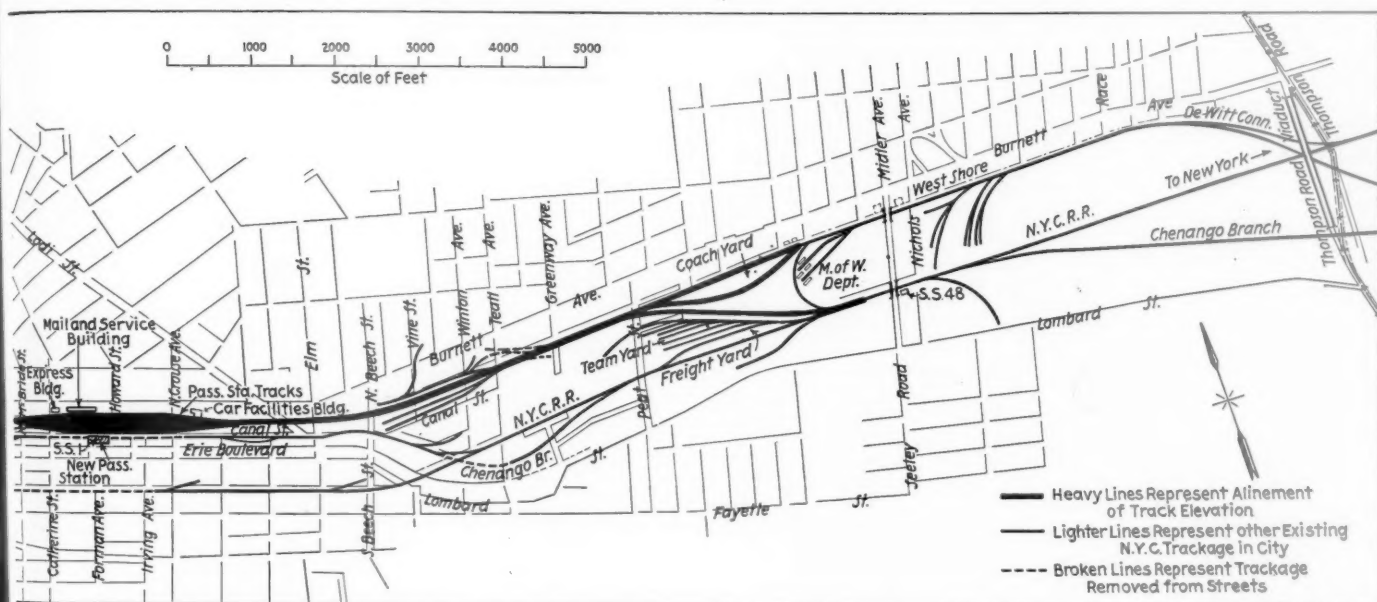
To avoid the large expense which would have been involved in building 4 to 4½ miles of temporary trestle to construct the fill between street bridges, other means of building the fill were employed. Throughout the eastern part of the city, west to Sand street, except for that section between State street and Onondaga creek, a material delivery track was constructed along the south side of the right-of-way, outside the limits of the bridge abutments which were being constructed at the different streets. Then, immediately along the north side of this track, draglines excavated a trench 10 to 12 ft. wide and 6 ft. deep, which formed a dumping pit for the material trains.

As material was dumped into the trench, it was re-handled by crawler-mounted draglines or cranes to build a one-track fill at final elevation toward the north side of the right-of-way, joining the adjacent newly con-

the old tracks shifted close to one side of the existing embankment, trainloads of filling material were dumped down the slope of the embankment, widening it out at the existing level to the full width of the final fill. Then, as additional material was dumped, it was picked up by draglines or cranes and cast toward the opposite side of the right-of-way in a plan to build a single-track fill at final sub-grade elevation. Upon the completion of this single-track fill, widening out to final width was done direct from cars operating on the high level.

### Large-Scale Masonry Work

With approximately 120,000 cu. yd. of concrete to place in bridge abutments, footings and retaining walls, the masonry work assumed large importance. Washed sand and gravel of high quality were secured from the same pit as the embankment material; cement was received in bulk in box cars; and practically all of the concrete for the entire job was batched in a single large central plant located near the site of the new passenger



Syracuse, N. Y.—Heavy Lines Show Alinement of the Elevated Tracks

structed street bridges. After this was completed, along with sufficient of each of the bridges to permit at least single-track operation, all subsequent widening for the three or more track fill was effected from the top of the initial fill, dumping directly from the cars.

Within the restricted area between State street and Onondaga creek, in the center of the city, where the fill was confined by retaining walls, sufficient material for one track at final elevation was trucked into position by motor trucks, operating over a dirt ramp extending up to the east end of the State Street bridge. When the single-track fill had been built progressively westward to Onondaga creek, and the track laid, the full section of fill was made by dumping direct from cars.

In the western part of the city, in the sections between Hiawatha, Liberty, North Geddes and Sand streets, where the existing tracks were already on a two-track embankment from 10 to 20 ft. in height, a somewhat different method of construction was adopted. Here, to avoid interference with the work on the new bridges, construction trestles were built across all of the streets, outside the limits of the new bridge work, with approaches connecting back to the existing sections of fill between the streets.

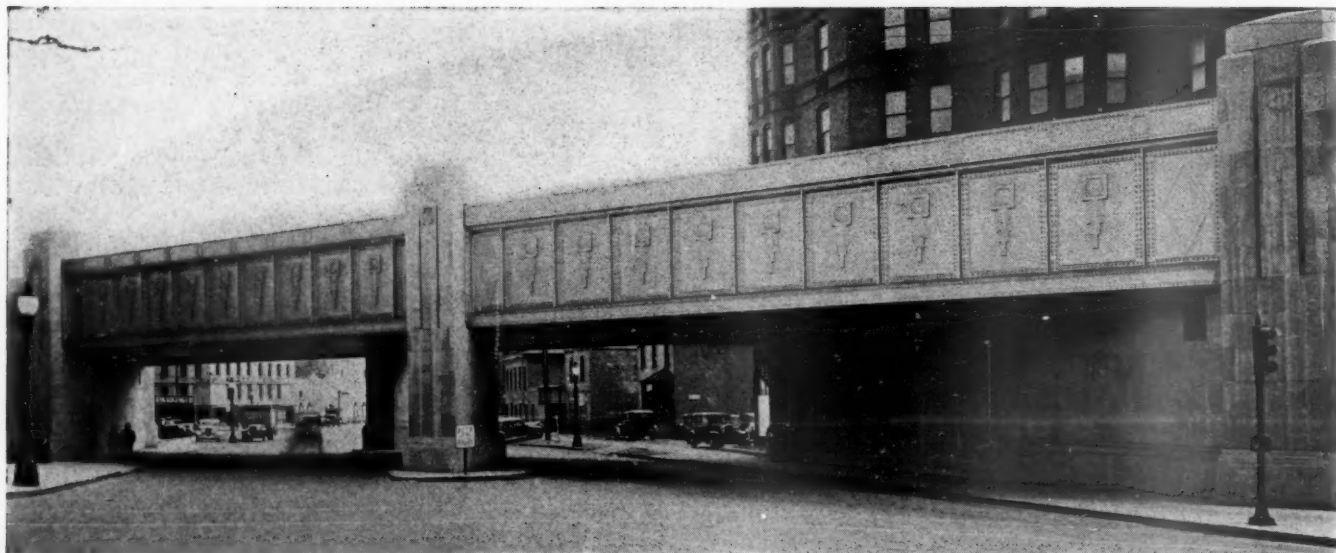
Operating over these trestles and thence over one of

station and was delivered to the various structures in a fleet of five four-yard truck mixers. With this equipment, which provided a wide range of flexibility, in excess of 1,100 cu. yd. of concrete were delivered to a half dozen or more locations daily in two eight-hour shifts.

Subsoil conditions throughout the length of the track elevation work, varying from limestone and shale to a soft silt material extending to a depth of 110 ft. or more, necessitated special consideration to bridge abutment footings, and, in some cases, to the design of the abutment itself. Wherever rock or hard-pan were encountered relatively near the surface, mass-type abutments without piles were employed, whereas in the softer materials, all foundations were placed on concrete or timber piles.

At several locations the vertical concrete or timber piles were supplemented with creosoted timber batter piles because of the very soft material overlying the hard bottom. At Hiawatha, Liberty, North Geddes and Sand streets, where subsoil conditions were particularly unfavorable, and where the height of fill varies from 30 to 40 ft., abutments of the cellular type were employed, with spread footings supported on concrete piles. Through this design, the weight of the abutments them-





The Bridges Within the Main Business District are Particularly Attractive—The State Street Structure is Shown Above

selves was spread over large areas, practically all horizontal thrust on the abutments was eliminated, and the weight of the fill in the abutment areas was kept to a minimum.

The cellular-type abutments employed have a heavily reinforced footing slab, approximately 50 ft. square and 4 ft. thick, a bearing wall supporting the bridge span which is approximately 6 ft. thick, and four longitudinal load-distributing walls, 30 in. thick, which support a 27-in. deck slab. A 30-in. curtain wall across the rear of the box, to a depth of 10 ft. 6 in. below the top of the deck slab, lowers the slope and volume of fill within the abutment.

#### Special Features in Bridge Construction

Of the 27 steel railroad bridges constructed in the projects, 12 are of the deck plate girder type, 9 are of the longitudinal wide-flange beam type, and 6 are of the through plate girder type. Of the 25 structures over streets, 13 employ single spans between abutments, 10 employ center-of-the-street columns, 1 employs curb columns, and another both curb and center columns. Special features of these bridges as a whole are that they are painted with aluminum paint, while the exposed steelwork in those structures in the main business district is specially ornamented to give it a pleasing appearance. From a structural standpoint, the most interesting features of the bridges are the extensive use made of large-section wide-flange beams, and the employment of nickel steel in the girders of two of the longer spans.

The five most interesting and attractive bridges are at North State, James, East Willow and North Salina streets, and at Oswego boulevard, all of which are three-track through plate girder structures, with or without center-of-the-street columns, and with the greatest amount of ornamentation. The structures at James and Salina streets are similar and involve the longest clear spans in the project, namely, 107 ft. and 109 ft., respectively.

In the case of all five of these bridges, the width of the right-of-way was so limited by adjacent buildings that it was impossible to use intermediate girders. Therefore, transverse floor beams, carrying three tracks, were spanned between two main girders. This resulted in very heavy floor beams and girders. The girders at James and North Salina streets, where the longest spans were required, were constructed of nickel steel, using a basic unit stress of 27,000 lb. per sq. in., and

have an over-all depth of 11 ft. 3½ in. The floor beams are wide-flange rolled beams, 36 in. deep, weighing 300 lb. per ft., and are spaced on 2-ft. 2½-in. centers.

The bridges at State street and Oswego boulevard employ columns in the center of the street, the State street structure involving two clear spans approximately 78 ft. long, and the Oswego boulevard structure two clear spans of 71 ft. Except for this feature, and the fact that girders of ordinary structural steel have been used, the bridges at these streets are similar to those at James and Salina streets. All of the bridges at these five streets have ⅝-in. steel deck plates which support rock ballasted tracks, the deck plate being covered with a concrete sub-base and three-ply membrane waterproofing, protected on top by a course of 1¼-in. asphalt plank. The asphalt plank was made to a special specification requiring that the filler material be entirely of a mineral character.

#### Bridge Ornamentation Unusual

Ornamentation of these five bridges is the same, involving essentially the uniform vertical panelling of the girder web plates, with an ornamental medallion in each panel, and the encasing and shielding of both the upper and lower flange assemblies. In the case of the upper flanges, the shield takes the form of a series of panelled ornamented steel plates, producing the aspect of a coping or parapet. In addition to the special treatment given to the steelwork at these bridges, the abutments and flanking pylons at these structures are faced with cast stone. All of the bridges in the project are finished with two coats of aluminum paint over a shop coat of red lead.

While the most thought and expense were obviously spent in enhancing the appearance of the five more important bridges directly in the main business district, all of the other street bridges, of both the deck-plate girder and longitudinal I-beam types, were made attractive through the use of ornamented columns and fascia girders with arched lower flanges. The largest railway bridges in the project, from the standpoint of the number of tracks carried, are those over North Crouse avenue and Catherine street, at opposite ends of the new passenger station layout, both of which carry 12 tracks and one or more turnouts. These structures are of the longitudinal I-beam, steel-plate-deck type, with a line of columns longitudinally through the center of the street.



In addition to the railroad bridges constructed over streets, a three-track main-line bridge and a single-track industrial line bridge were constructed over Onondaga creek; one long highway bridge was constructed to carry Thompson road over the tracks, and two highway bridges were built to carry Midler avenue over the tracks. The main-line bridge over Onondaga creek includes a main span of 74 ft. 6 in., a tower span of 25 ft., and two approach spans, one 85 ft. long and the other 45 ft. 5 in. long. This structure is of the longitudinal girder type throughout, with a concrete slab deck.

The highway bridges carrying Thompson road and Midler avenue are steel structures, with concrete decks, the bridge carrying Thompson road, with its viaduct approaches, being approximately 1,650 ft. long and approximately 50 ft. above the tracks. The Midler Avenue bridge over the New York Central tracks has a center or main span of 88 ft. 6 in., flanked on each end by a 45-ft. approach span, while the Midler Avenue bridge over the West Shore tracks has one span 117 ft. 6 in. long and two flanking spans 41 ft. 6 in. long.

#### Attractive New Station

The station is located on the south side of the tracks between Catherine street and North Crouse avenue, about three-quarters of a mile east of the old station at Franklin street, on a site much more open and attractive than that of the old station and more generally accessible from all sections of the city. The building is at the street level, about 20 ft. below the level of the tracks, and faces Erie boulevard, an existing paved street 80 ft. wide constructed over the bed of the old Erie canal.

The station structure, which occupies an area approximately 163 ft. long by 100 ft. deep, reflects the modern trend in architecture and consists of an impressive central section, four stories high, with tower set-backs at the top, flanked by three-story wings. The building has a structural steel frame, and the central section is faced with limestone, while the wings are faced with brick in a range of gray-buff color. A three-foot base course of polished granite surrounds the entire structure, and limestone trim, copings and belt courses car-

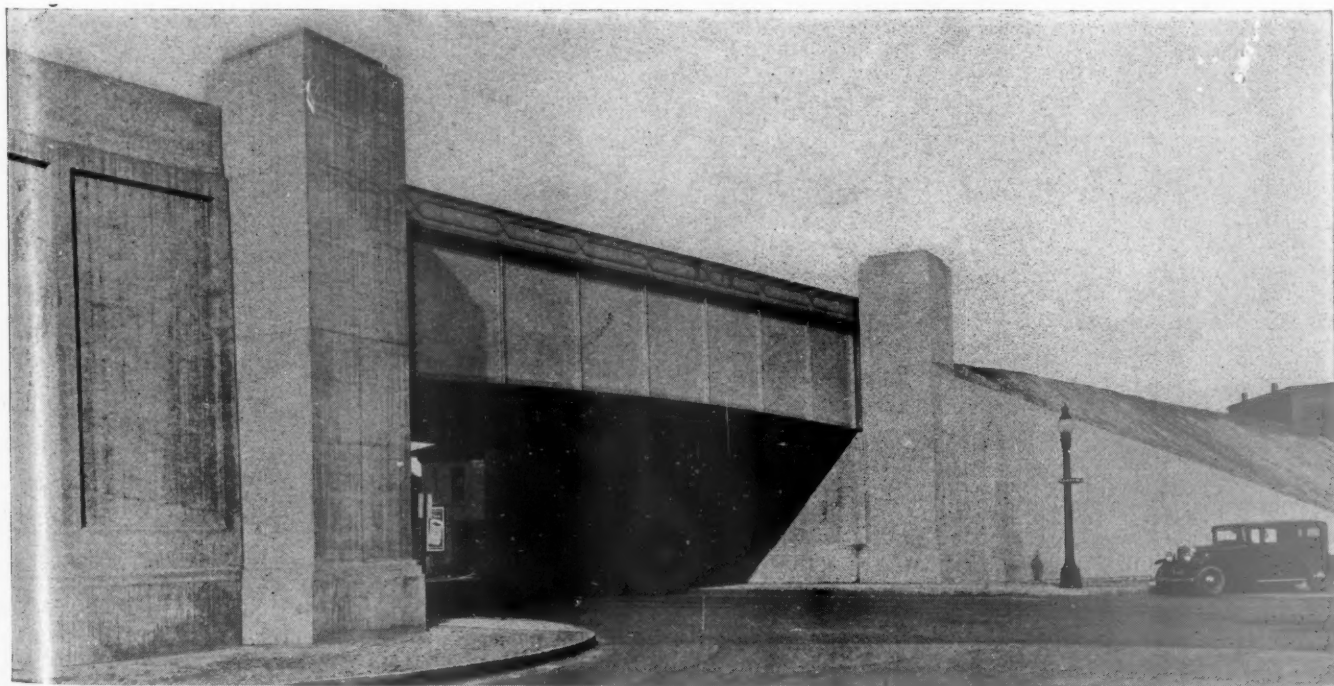
ried around the wings tie them harmoniously into the center section.

The predominating lines of the structure are vertical, produced largely by the tower-like lines of the central section, the front face of which is given over largely to a main entrance facade in glass, above a marquis sheltering a group of four entrance doors. Lending a pleasing modern touch to the exterior is the use of structural aluminum for all window frames and spandrels, for doors and door frames, and for the entire facing of the main entrance marquis, as well as that of a smaller marquis over a secondary entrance and exit on the west side of the west wing.

#### Interior Pleasing

The central section of the station is given over to a general concourse and waiting room approximately 58 ft. wide by 78 ft. deep, which is immediately surrounded by passenger service facilities such as ticket offices, a restaurant, newsstands, parcel and baggage checking counters, telephone and telegraph facilities, and toilet and wash rooms. The floor within this main area, which is at practically the street level, is of buff terrazzo, with a black marble border and base. The ceiling, 24 ft. above the floor, is of the coffered type in pre-cast acoustical plaster, finished in various tones of brown and tan, and the side walls are of rose-tan Montana travertine, surmounted by a 24-in. decorative frieze done in acoustical material, finished to harmonize with the color predominating in the ceiling. All doors, frames, counters, grills and miscellaneous trim throughout the waiting room are of satin-finish aluminum, as are also the flush-type electric lighting fixtures which are arranged in the ceiling in panel formation, and the special concealed lighting fixtures over such facilities as the ticket windows, baggage counter and the train bulletin board. A feature of the waiting room is its lounge-like informal atmosphere, produced by the substitution of tables and leather-upholstered seats and settees scattered about on rug-covered areas, for the usual type of waiting room furnishings.

The lunch room, which occupies an area 50 ft. long and 20 ft. deep along the front of the east wing, is in



The Bridge at Franklin Street is Typical of Many of the Structures Outside of the Main Business District



Looking Northeast Over the New Passenger Station and Its Extensive Elevated Track and Platform Layout

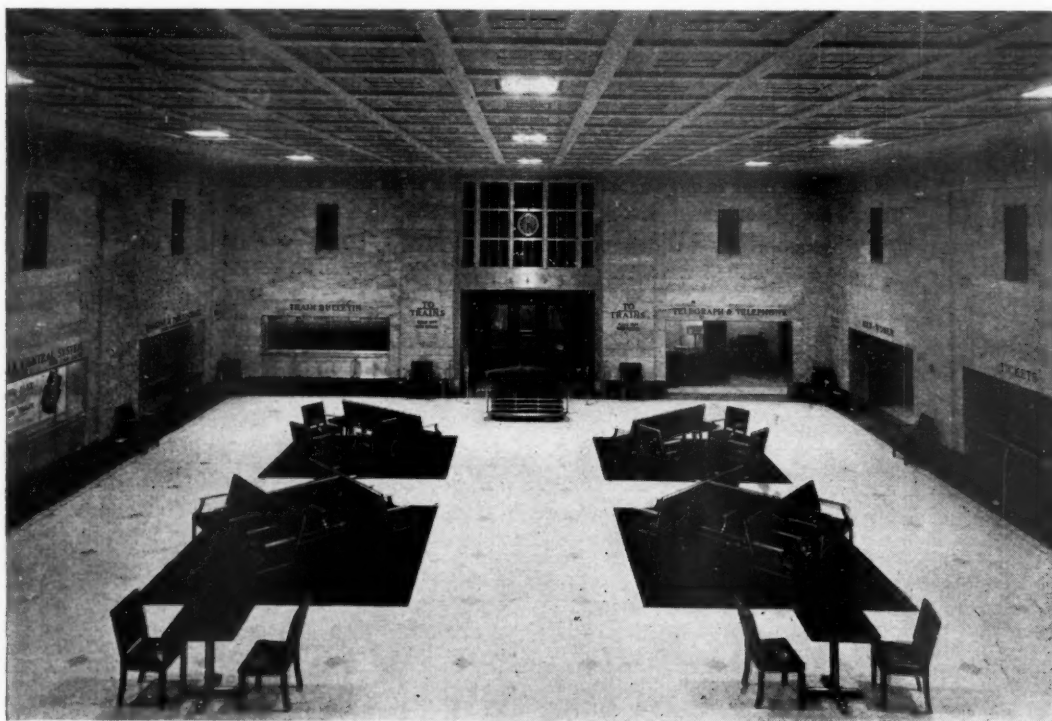
direct connection with the waiting room. The service facilities here include a long, low-type, marble-top counter with 22 leather-upholstered stools, and a series of tables and chairs along the front windowed face of the room. All serving facilities behind the counter are modern in every respect and are of aluminum or Monel metal. The kitchen facilities are located directly back of the lunch room.

The basement of the station, which extends under the entire building, is used largely for storage, locker space, and for housing mechanical facilities. The upper stories of the station are finished as a modern office building and are given over almost entirely to offices for the various local departments, and for housing local service facilities such as telephone switchboards, heating system fans and switch and signal control equipment. The latter facilities are located at the rear of the central section of the station, on the fourth floor, in a penthouse enclosed on three sides by windows, which is used as a signal station for controlling track switches and signals in the immediate vicinity of the station.

Heating of the main passenger areas of the building is by hot air passed over steam coils supplied with steam from a heating plant located in the mail and service building directly back of the station on the north side of the tracks. Fans employed in the heating system are located on the mezzanine floor. These fans draw fresh air from louvred openings in the exterior walls and deliver it to heater rooms on the second floor of the station, front and rear, and thence through aluminum louvred grills in the walls of the concourse and waiting room. All heating of the smaller confined areas of the station proper, as well as of the office areas, is by direct radiation.

#### Effective Track Layout

The track layout at the station includes ten main passenger tracks, served by four low-level island platforms, a narrow service platform, and a mail and express platform. All of the platforms are of reinforced concrete construction, supported on concrete piles. The passenger platforms are from 1,450 ft. to 2,050 ft. long, and



The Concourse and Waiting Room is Fitted With Leather Upholstered Chairs and Settees Scattered About on Rug-Covered Areas



for the greater part of their length are 22 ft. wide and covered with steel-frame butterfly-type canopies, 26 ft. wide. The canopies have concrete tile roofs, weather-proofed with three-ply, built-up roofing.

The entire station track layout is supported on earth fill between street bridges, the fill in this area along both sides being for the most part retained by concrete retaining walls. On the south side, the wall flanking both sides of the passenger station extends from a point east of North Crouse avenue to a point west of Catherine street, a total distance of approximately 1,900 ft., while on the north side, the wall, approximately 600 ft. long, affords the necessary room for the mail, service and express facilities.

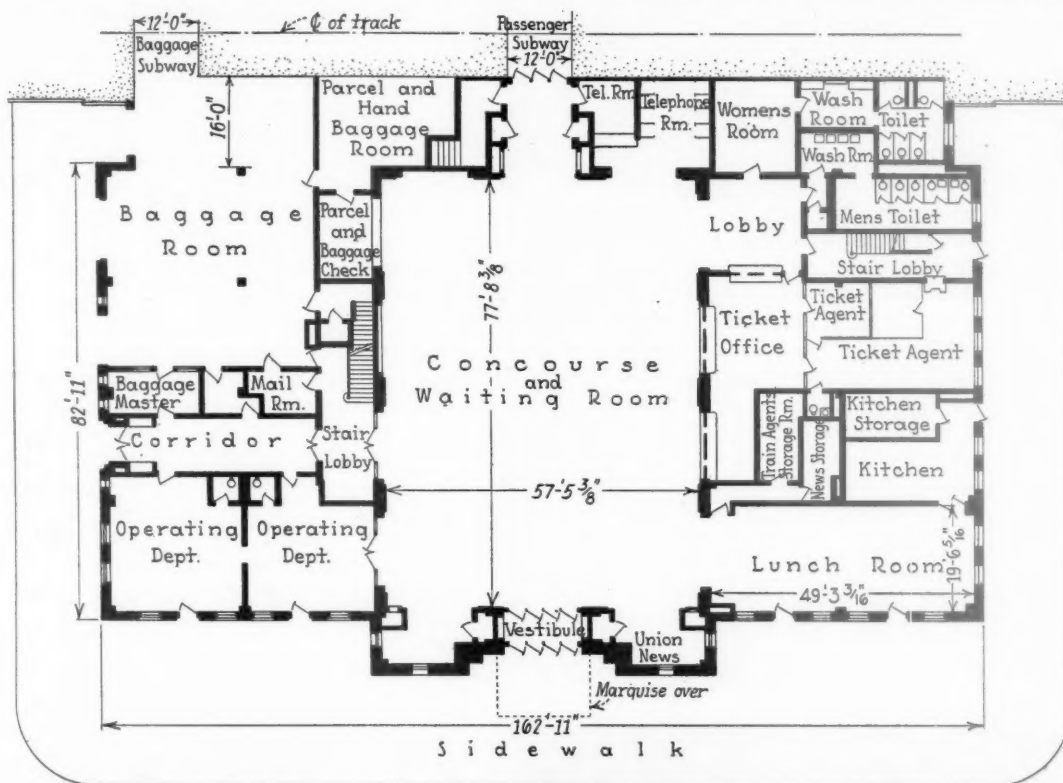
Access to the station platforms for passengers is by means of pairs of enclosed stairways, leading each way from a passenger subway, 12 ft. wide, which extends directly from the north end of the station concourse and waiting room, approximately 270 ft. to an exit on Burnet avenue on the north side of the tracks. The passen-

connected in pairs, and crossovers at both ends of the station layout make it possible to use any of the tracks in either direction. Furthermore, in addition to the main tracks at the station, short tracks, stubbed at the ends of the platforms, or connected back into the main tracks to form short sidings, are provided for the purpose of holding locomotives, coaches, diners, sleeping cars or other equipment to be added to or set out of trains.

One other track within the station layout lies along the north side of the main passenger tracks and, while essentially a passenger track for the use of local trains, or for holding mail and express cars or other equipment temporarily, is used also as a coal delivery track for the station heating plant within the mail and service building. This track is flanked on one side by the most northerly passenger platform and is stubbed within the service building.

At each end of the station platform facilities are located water columns and a small brick car inspectors' building. The car inspectors' buildings each afford an office,

General Plan of the First Floor of the New Station, Showing the Locations of the Various Passenger Facilities



ger subway, which is at practically the same level throughout as the concourse and waiting room, is of reinforced concrete box construction, with painted interior walls and ceiling.

The station platforms serve for handling mail, baggage and express, as well as for the handling of passengers, exit for baggage trucks being afforded by electrically-operated elevators, one of which serves each platform. These elevators operate down to a baggage subway beneath the track level, which extends from the baggage room in the west wing of the passenger station directly into the mail and service building on the north side of the tracks. The baggage subway, like the passenger subway, is of reinforced concrete box construction, and is 12 ft. wide.

All of the station tracks are stone ballasted throughout, both on the fill sections and over the different underpasses. The track structure itself is of the standard type of construction employed on the Central.

In order to facilitate switching movements and the changing of locomotives, the station tracks are largely

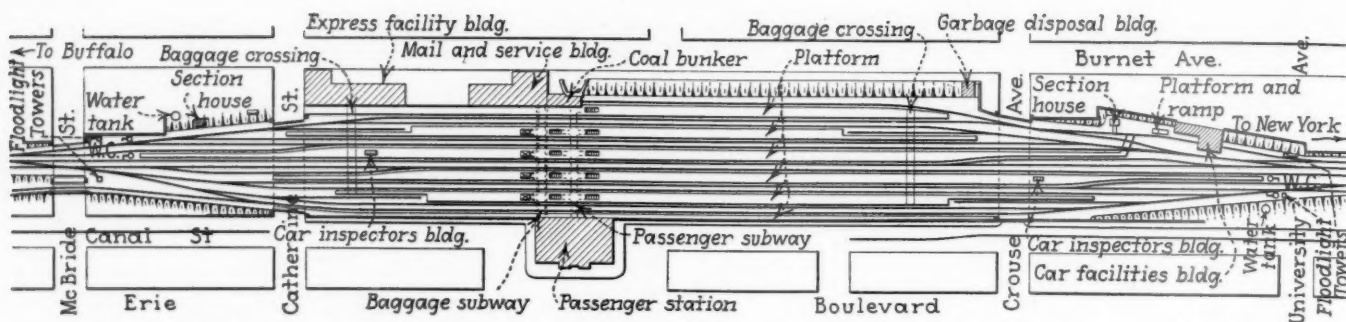
and storage space for oil and journal box packing and for other materials and supplies required by the car inspectors.

Four 100-ft. floodlight towers, two at each end of the station track area, each equipped with a battery of three main projectors fitted with 1500-watt lamps, illuminate the entire station track and platform layout for night operation. The projectors are equipped with special lenses to confine the lighting within the side limits of the station tracks, and are directed downward to insure adequate illumination of the uncovered narrower ends of the platforms where any form of platform lighting standards would have interfered with the handling of passengers and baggage, mail and express. An additional 500-watt projector on each of the towers at the east end, directed abruptly downward at the locomotive water columns at this end, facilitate the taking on of water at night.

#### New Interlocking Facilities

As a part of the construction of the new elevated route through Syracuse, three interlockings and inter-





General Plan of the Track and Platform Layout at the New Station, Showing the Locations of the Various New Buildings

mediate automatic signals were provided. At Syracuse Junction, where the new elevated line connects with the main line, a new 63-lever electric interlocking, Signal Station No. 2, was constructed. At the east end of the new line, a 24-lever mechanical interlocking was installed, in what is called Signal Station No. 48. A new electric interlocking, Signal Station No. 1, was installed to handle the switches and signals in the area of the passenger station, the control room forming a penthouse on the track side of the station building.

This plant at the station includes some of the most modern apparatus in the interlocking field, a feature being the C. T. C.-type control machine employed, in which the locking is effected by the interconnection of circuits rather than by mechanical locking between levers. This new type of interlocking permits the use of miniature-type levers mounted on a desk panel, so arranged that the operator can reach any lever without leaving his chair. It further expedites changes of routes because the levers need not be operated in a particular sequence, and there is no delay waiting for indications for release of lever locks.

Searchlight type color-light signals are used throughout, those within the station area being dwarfs, arranged to display complete aspects so as to expedite train movements. The power supply system for this interlocking is a new development, including a mercury-arc rectifier for normal operation of the d-c. switch machines. Normally, the d-c. track and control circuits are fed through rectifiers which are fed from an a-c. source, the stand-by source of a-c. being furnished from a dynamotor driven from a storage battery. The special power

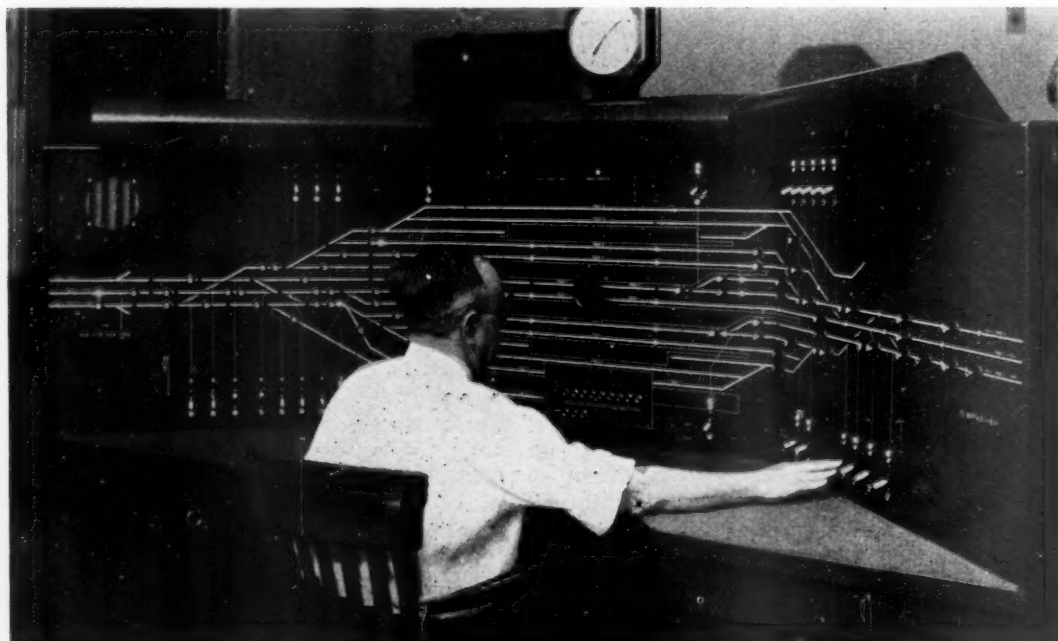
supply equipment is of General Electric manufacture. All of the new signal and interlocking equipment, with the exception of the mechanical plant at the east end, was furnished by the General Railway Signal Company, the installation being made by the signal department forces of the railroad.

#### Other Buildings in Station Layout

The mail and service building is a two-story, steel-frame brick-faced structure, with reinforced concrete floors throughout, located directly back of the station on the north side of the tracks. This building is divided essentially into two units, one with a frontage of approximately 50 ft. on the tracks and approximately 75 ft. deep, housing station service facilities, and the other, with a frontage of approximately 110 ft. on the tracks and approximately 45 ft. deep, employed entirely in the handling of mail.

The service unit houses the heating plant, air compressors and transformers required for the entire station layout, and, in addition, at the second floor level, provides office space and a large room containing the main switchboards and the motor generator sets for charging storage batteries on coaches and electric tractors. An enclosed track hopper discharges the coal supply for the heating plant directly within the building, and a radial brick chimney, 150 ft. high, provides draft for the boilers. The boilers, of which there are three, are stoker fired and are provided with mechanical ash-handling equipment.

The mail unit of the building, which is provided with a truck elevator and a chute for the transfer of mail be-



The Desk Panel of the C. T. C.-Type Control Machine at Signal Station No. 1, Within the New Passenger Station

tween floors, fronts directly on the adjacent track platform at its second story level, and on the baggage subway and a large highway truck back-up space at the street level. The track-level floor, the track side of which is provided with three large overhead trucking doors, is given over to truck storage space, enclosed areas for postal clerks and transfer clerks, and trucking aisles to the elevator and mail chute.

The ground floor, which has wide, door-protected truck openings on both sides, has a raised U-shaped platform over which sacked mail or parcels are transferred from the platform trucks to street trucks, and vice versa, without the necessity of lowering and raising them to and from the floor level.

The new express building serving the station is located on the north side of the tracks, west of the mail and service building. This unit has a main two-story and mezzanine office unit, 90 ft. long by 55 ft. wide, fronting on Catherine street and Burnet avenue, and a covered loading platform 143 ft. long by 34 ft. wide, extending along Burnet avenue, with enclosed connection with the mail and service building and the baggage subway. This building, which provides complete facilities for the expeditious handling of express into and out of the city, is the same general type of construction as the mail and service building, and, like that building, it is reached from the track platforms entirely under cover.

The car facilities building, located on the north side of the tracks near the east end of the station track layout, is a brick building similar in general construction to the other auxiliary buildings at the station, with a two-story and basement main section, 57½ ft. long by 27 ft. wide; a one-story annex at one end, at the track level, 35 ft. by 27 ft.; and a coach receiving shed, on the track side, at the track level, approximately 50 ft. long by 25 ft. wide. Within this building, which provides complete facilities for making running repairs to passenger cars, including the changing of wheels, the main, or track-level floor, provides a large stores department room, an oil and journal box packing storage room, and a machine shop area. Within the coach receiving shed there is a wheel drop table, served by a pit and a wheel runway extending into the basement floor of the building, which is given over entirely to wheel storage space. The upper floor of the building provides offices for the car department and the Pullman department, a Pullman car cleaners and storage room, and a large car department locker room, together with adequate wash and toilet facilities.

Another separate building unit of interest at the station is the two-story brick and concrete refuse disposal building constructed on the north side of the tracks near North Crouse avenue. The upper floor of this unit, which is at the track level and connected directly with the adjacent track platform, is essentially a can cleaning room with a rectangular hopper in the center of the floor, which connects with a fixed chute which discharges directly into trucks at the street-level floor. Here, all garbage or refuse from the station or from cars can be disposed of readily, and loaded directly into city sanitary department trucks without rehandling.

#### Many Companies Represented in Work

The station and grade separation work at Syracuse has been planned and carried out by the engineering department of the New York Central, under the general direction of J. W. Pfau, chief engineer, and E. A. Dougherty, assistant chief engineer. Bridge design was handled by H. T. Welty, engineer of structures; building design by J. P. Gallagher, architect; and mechanical

and electrical work by D. B. Thompson, mechanical and electrical engineer. The signal work was planned and carried out under the direction of F. B. Wiegand, signal engineer. All construction operations at Syracuse have been under the direction of A. D. Duffie, assistant engineer.

The principal contractors on the work have been the Walsh Construction Company, Davenport, Iowa, which handled all of the grading and bridge masonry work in connection with the track elevation, and also the construction of the station platform facilities; the American Bridge Company, which supplied the steel and erected all of the bridges; Wm. M. Ballard, Inc., Syracuse, which erected the passenger station and the mail and service building; the Duffy Construction Corporation, New York, which erected the express building and the refuse disposal building; and Gorsline & Swan Construction Company, Rochester, N. Y., which erected the car facilities building and the car inspectors' buildings. The steel for the passenger station and the mail and service building was furnished by the Bethlehem Steel Company and was erected by the McClintic-Marshall Corporation, while the steel for the express building was furnished and erected by the American Bridge Company. The Leach Steel Company, Rochester, N. Y., furnished and erected the steel for the car facilities building.

## Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended September 26 totaled 807,070 cars, a new peak for this year and an increase of 177,135 cars or 28.1 per cent as compared with the total for the corresponding week of last year. This also represented an increase of 17,560 cars as compared with the total for the preceding week. All commodity classifications showed increases as compared with last year except grain and grain products, in which there was a decrease of 5,524 cars. Miscellaneous freight loading increased 63,440 cars and coal increased 79,955 cars. The summary, as compiled by the Car Service Division of the Association of American Railroads, follows:

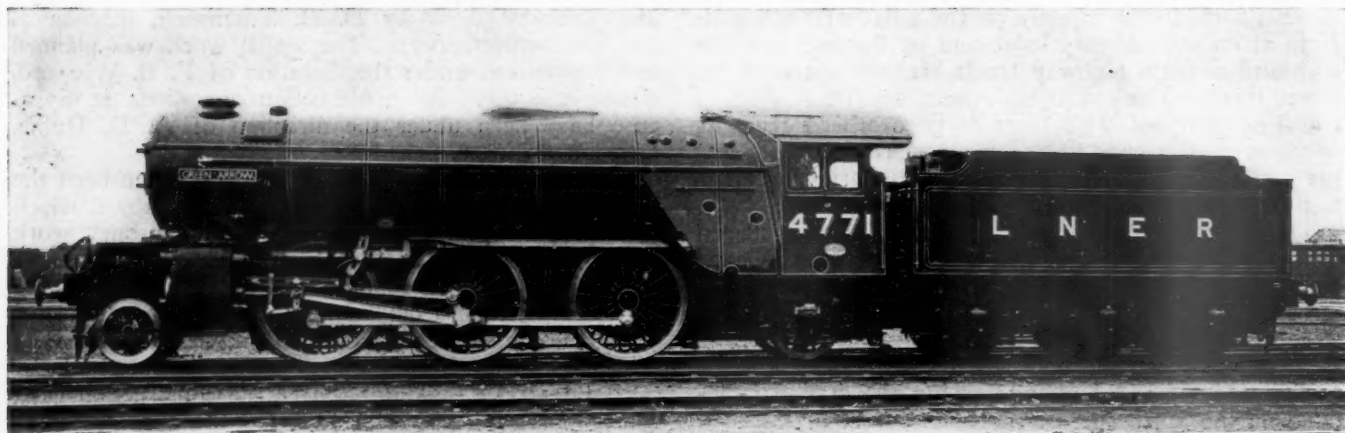
Revenue Freight Car Loading  
For Week Ended Saturday, September 26

Districts	1936	1935	1934
Eastern .....	158,942	141,727	133,154
Allegheny .....	162,081	114,852	114,808
Pocahontas .....	57,172	15,189	46,169
Southern .....	112,412	96,968	91,830
Northwestern .....	131,364	108,423	96,163
Central Western .....	120,092	98,768	104,596
Southwestern .....	65,007	54,008	59,364
Total Western Districts.....	316,463	261,199	260,123
Total All Roads.....	807,070	629,935	646,084
Commodities			
Grain and Grain Products.....	33,674	39,198	32,614
Live Stock .....	19,321	18,303	30,545
Coal .....	142,808	62,853	123,754
Coke .....	9,920	6,445	5,209
Forest Products .....	37,131	32,461	22,974
Ore .....	58,604	34,882	21,868
Merchandise L.C.L. ....	172,051	165,672	164,610
Miscellaneous .....	333,561	270,121	244,510
September 26 .....	807,070	629,935	646,084
September 19 .....	789,510	706,820	644,498
September 12 .....	699,859	599,786	647,485
September 5 .....	764,680	591,941	563,883
August 29 .....	753,742	680,848	647,531
Cumulative Total, 39 Weeks.....	26,178,592	23,112,084	23,362,452

#### Car Loading in Canada

Car loadings in Canada for the week ended September 26 totaled 59,835 cars, a new high for the year. The  
(Continued on page 525)





The 2-6-2 Type "Green Arrow" for Passenger and Express Service

# Three-Cylinder Locomotives on the London & North Eastern

Two new designs for high-speed service—the 2-8-2 type has been streamlined

THE London & North Eastern has recently completed at its Doncaster Works the first of a series of 2-6-2 type passenger and express locomotives and four 2-8-2 type passenger locomotives. One of the illustrations shows No. 4771 (the 2-6-2 type) which has been named the "Green Arrow" and the other illustration shows the first of the 2-8-2 type to be completed, No. 2003, which has been named the "Lord President." The principal dimensions and weights of both types are given in the table. The detailed descriptions follow.

## The Green Arrow

The boiler of the Green Arrow follows the design of the L. & N. E. Class A-3 Pacific type locomotive. It has a maximum barrel diameter of 6 ft. 5 in. and is designed for a working pressure of 220 lb. per sq. in. The grate area is 41.25 sq. ft., and grates of a special design give a ratio of air space to total grate area of 56 per cent. The total evaporative heating surface is 2,431 sq. ft. The boiler is provided with a steam collector through which all steam entering the throttle valve must pass. The entrance to the steam collector is through a series of circumferential slots cut in the top of the barrel plate. This arrangement has proved successful against priming. To avoid wire-drawing through the slots their total area has been made equal to twice the area through the throttle valve, which has a steam area of 38 sq. in. There are three steam pipes of 5 in. inside diameter. The locomotives are equipped with a 43-element Robinson superheater having a cast-steel header and short loop units 1½ in. in external diameter.

The boiler is fitted with a Davies & Metcalfe Exhaust steam injector on the right-hand side and with a Gresham & Craven No. 11 live-steam injector on the

left-hand side. The barrel of the boiler and the fire-box are insulated with Alfol. The cylinders are insulated with asbestos.

The three cylinders are each 18½-in. bore by 26-in. stroke. The cylinders, steam chests, smokebox saddle and all steam and exhaust passages are cast as one unit. The outside steam pipes are also integral with the main casting. Each cylinder is fitted with spring-loaded relief valves of large diameter in addition to the usual cylinder drain cocks. The latter are operated from the cab by Bowdenex cable. The piston valves are 9 in. in diameter. The valve gear is of a type which has been applied to over 470 locomotives on the L. & N. E., the valves for the outside cylinders being actuated by Walschaert gear and the inside valve being driven through a Gresley gear. The maximum cut-off is 65 per cent, in which position the valve travel is 5½ in. Ball and roller bearings are fitted to the valve gear throughout.

The piston heads and rods are of steel, forged in one piece, each piston head being fitted with two rings ⅝ in. wide. Cast-iron packing is used for the piston glands. All three cylinders drive on the second axle, the crank axle which takes the drive from the center cylinder being of five-part built-up construction.

The driving wheels are 74 in. in diameter, with 9½-in. by 11-in. journals. All of the revolving weight and 40 per cent of the reciprocating weight is balanced. The revolving weight at the center crank is balanced by means of extensions to the crank webs, while the remainder is balanced in the conventional manner in the wheel centers. The main and side rods are of chrome-nickel steel and are lubricated by wick oilers. Felt pads are fitted at the top and bottom of each bearing. The main driving journals are lubricated by a six-feed Wakefield mechanical lubricator carried on the



left-hand running board. The gear operating the lubricator, as well as a similar lubricator for the cylinders, is fitted with ball bearings throughout.

The engine truck is of the double-swing-link type permitting movement of  $5\frac{1}{2}$  in. either side of the center position. All of the swing-link pins and slides are lubricated by grease. The trailing wheels are fitted with Cortazzi axle boxes, designed to permit maximum movement of  $2\frac{1}{2}$  in. either side of the center position. The brakes on both engine and tender are of the vacuum type which two 24-in. diameter brake cylinders on the engine and two 21-in. diameter cylinders on the tender. This gives a braking power equal to 67 per cent of the weight on the wheels. A Davies & Metcalfe ejector is used. The locomotive is equipped with hand-operated sanders on the engine truck and steam-operated sanders on the driving wheels. The sand boxes, as well as the ashpan, are entirely of welded construction.

The six-wheel tender carries 5,250 U. S. gallons of water and 8.4 tons of coal and is equipped with a screw-operated water scoop. The total weight of the engine and tender is 322,784 lb.

### The Lord President

The Lord President is a development of the two 2-8-2 type passenger locomotives, Nos. 2001 and 2002, named the "Cock o' the North"\* and the "Earl Marischal," which were placed in service on the Scottish lines of the L. & N. E. in 1934. A further series of four locomotives is now being completed. The first of these, No. 2003, has been named the "Lord President." The front end of this locomotive has been designed along similar lines to that of the "Silver Link" type engines, as this external form has been found entirely successful in lifting the smoke clear of the engineman's view.

The boilers of the first three of these four locomotives are identical with those on the previous 2-8-2 type locomotives, having a maximum barrel diameter of 6 ft. 5 in., a distance between tube sheets of 18 ft.  $11\frac{3}{4}$  in., 50 sq. ft. of grate area, and a total evaporative heating surface of 2,714 sq. ft. The working pressure is 220 lb. The boiler of the fourth locomotive will have a longer combustion chamber giving a firebox heating surface of 253 sq. ft. and a firebox volume of 319 cu. ft.

The grates used in these boilers have a ratio of air space to total grate area of 56 per cent. The boilers are equipped with 43-element Robinson superheaters. Access to the main smokebox door is through doors in the front streamline casing, one of which lifts upward and the other drops downward over the buffers. The doors

are hand-operated through bevel gearing. A chime whistle is located in front of the stack. The boiler is fitted with a Davies & Metcalfe No. 12 Class H exhaust-steam injector on the right side and with a Gresham &

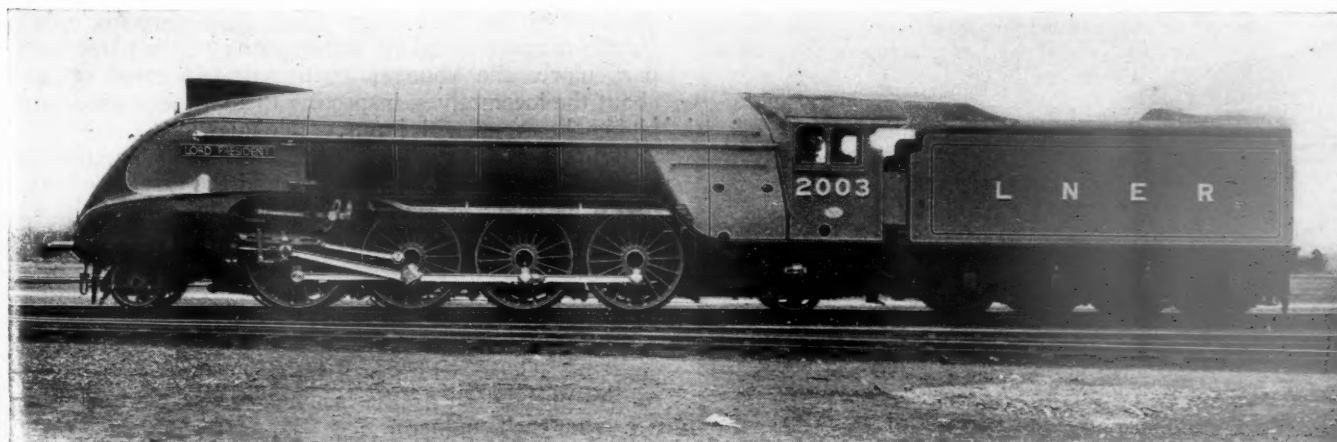
### General Dimensions and Weights of the London & North Eastern Locomotives

	"Green Arrow" R.R. Co., Doncaster Works	"Lord President" R.R. Co., Doncaster Works
Builder .....	1	4
Number built .....	V2	P2
Road class .....	4771	2003—6
Road numbers .....	2-6-2	2-8-2
Type of locomotive .....	Express and passenger	Goods (Freight)
Service .....		
Rated tractive force, 65 per cent cut-off, lb. ....	33,730	43,462
Weights in working order, lb.:		
On drivers .....	146,944	176,848
On front truck .....	24,640	23,968
On trailing truck .....	36,960	39,200
Total engine .....	208,544	240,016
Tender .....	114,240	129,696
Wheelbases, ft. and in.:		
Driving .....	15—6	19—6
Engine, total .....	33—8	37—11
Engine and tender, total .....	36—2 $\frac{1}{2}$	64—0 $\frac{1}{2}$
Driving wheels, diameter out- side tires, in. ....	74	74
Cylinders, number, diameter and stroke, in. ....	3—18 $\frac{1}{2}$ x 26	3—21 x 26
Valve gear, type .....	Outside, Walschaert; inside, Gresley	Outside, Walschaert; inside, Gresley
Valves, piston type, size, in. Maximum travel, in. ....	9" 5 $\frac{1}{2}$ "	9" 5 $\frac{1}{2}$ "
Boiler:		
Steam pressure, lb. ....	220	220
Diameter, first ring, inside, in. ....	69 $\frac{3}{16}$	69 $\frac{3}{16}$
Grate length, in. ....	70 $\frac{15}{16}$	86
Grate width, in. ....	83 $\frac{3}{4}$	83 $\frac{3}{4}$
Tubes, number and diameter, in. ....	121—2 $\frac{1}{4}$	121—2 $\frac{1}{4}$
Flues, number and diameter, in. ....	43—5 $\frac{1}{4}$	43—5 $\frac{1}{4}$
Length between tube sheets, ft. and in. ....	17—0	18—11 $\frac{3}{4}$
Grate area, sq. ft. ....	41.25	50.00
Heating surfaces, sq. ft.:		
Firebox .....	215.0	237.0
Tubes and flues .....	2,216.1	2,477.0
Evaporative, total .....	2,431.1	2,714.0
Superheating .....	679.6	776.5
Combined evap. and superheat	3,110.7	3,490.5
Tender:		
Style .....	Water bottom	Water bottom
Water capacity, U. S. gal. ....	5,250	6,250
Fuel capacity, short tons. ....	8.4	8.96

Craven No. 11 injector on the left side. The boiler and firebox are insulated with Alfol.

The three cylinders are each 21-in. bore by 26-in. stroke and are cast in one piece. The piston rods and heads are of steel, forged in one piece. The piston valves are 9 in. in diameter and have a maximum travel of  $5\frac{1}{2}$  in. The valves of the outside cylinders are operated by

\* Railway Age, July 14, 1934, page 33.



The 2-8-2 Type "Lord President" With the Streamlined Front End

Walschaert gear, while the valve of the inside cylinder is actuated by the Gresley gear. Ball and roller bearings are used throughout the valve gear. The main and connecting rods are of chrome-nickel steel and all three cylinders drive on the second pair of coupled wheels. The engine truck is of the double-swing-link type.

Both engine and tender are equipped with vacuum brakes, there being four 21-in. diameter cylinders on the engine and two 21-in. diameter cylinders on the tender. The eight-wheel tender carries 6,250 U. S. gallons of water and 8.96 tons of coal. The total weight of the engine and tender is 369,712 lb.

## Chicago "Fan" Excursion Brings Out 472 Customers

**R**AILROAD "fans" and enthusiasts in the Chicago area—472 of them—became "railroaders for a day" on Sunday, October 4, when they took advantage of an "off the beaten track" excursion which was operated by the Pennsylvania through the Northern Indiana countryside at a fare of \$3.50 for about 360 miles. The excursion was operated under the auspices of the Chicago chapter of the Railway and Locomotive Historical Society and was designed principally to afford members of the society and the public an opportunity to inspect and photograph railway equipment and facilities to an extent that is rarely permitted. It was also in the nature of an outing through sparsely populated rural areas where there was much of an historic and scenic nature to capture the interest of the passengers. A bright sun and moderate temperatures made conditions ideal.

Leaving from the north side of the Chicago Union Station at 9 a.m., eastern standard time, the train, carrying 10 coaches and 2 diners, traversed the Pan Handle line of the Pennsylvania southeastward 116 miles to Logansport, Ind., where it transferred to the Butler branch, traveling northeastward 76 miles to La Ott, Ind. At the latter point the train transferred to the Grand Rapids division, proceeding south 17 miles to Ft. Wayne, from which point the return trip of 149 miles to Chicago was made over the route of this company's Chicago-New York trains. Arrival in Chicago was at 7:12 p.m. E.S.T.

The "off the beaten track" part of the excursion came during passage over the Butler branch, where no regular passenger trains have been operated for several years. On this line, which traverses a rather heavily wooded agricultural region, the speed of the train was limited to



View of the Crowd at Ft. Wayne As It Converged on the Enginehouse

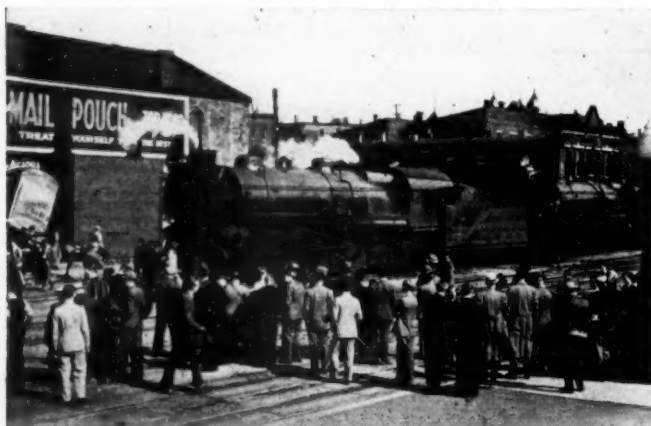
a maximum of 45 miles an hour, and it was because of the limitations afforded by this portion of the route that it was necessary to employ light motive power on the outgoing trip, the train being pulled by two K-2 (light Pacific) locomotives as far as Ft. Wayne.

To make it possible for the passengers to keep themselves oriented throughout the trip and to identify points of interest, a detailed itinerary and other descriptive literature were provided. In the itinerary, which consisted of 15 mimeographed sheets, the railroad track was represented by a vertical line extending the length of each sheet. At the proper points along the line appeared the names of towns and cities, with mileages from junction points or important cities, and other notes identifying railroad intersections and yards, waterways, important industries, and other features of interest. The itinerary also included notes on matters of historical interest, such as the names of explorers, Indian tribes and early settlers identified with particular towns or regions.

Recognizing that the average railroad enthusiast is an avid collector of locomotive views, the railroad so arranged the schedule as to provide plenty of time for the wielding of cameras, of which there must have been in the neighborhood of 150 on the train, representing every conceivable type. Stops of about 40 min. each at Logansport and Ft. Wayne were made specifically for this purpose. At Logansport, those passengers with cameras hurried to the front end of the train, where they made a concerted onslaught on the locomotives, photographing them from all angles and positions. So absorbed in this occupation were many of the cameramen that they were oblivious to the tooting horns of local motorists who were waiting impatiently to get across the tracks. At all stops of the train, even where they were made only for the purpose of taking water, many of the passengers, particularly the younger contingent, swarmed on and about the locomotives, inspecting them at close range and plying the crews with innumerable questions.

But the big opportunity for the close inspection of railroad facilities and equipment and the display of photographic talent was afforded during the stop at the Ft. Wayne engine terminal of the Pennsylvania. Here elaborate advance preparations had been made. Locomotives of various sizes and for different classes of service had been arranged in the open where they could be conveniently photographed and inspected. For identification purposes a large white card bearing essential facts concerning the design of the locomotive was placed prominently on each engine.

Enginehouse foremen, acting as guides, showed groups  
(Continued on page 525)



Photographing the Locomotives at Logansport



# Management's Four-Fold Task\*

Has obligation to labor, to investors, to public and to itself,  
in wise selection of future leaders

By M. W. Clement,  
President, Pennsylvania

THE railroads, the country's chief source of transportation, are privately owned by the public at large. In addition to their million stockholders, there is also a great number of bondholders. Life insurance companies of this country have 33,000,000 policy holders and are all large investors in railway securities. Savings and other banks, educational institutions and fire insurance companies are dependent to a considerable extent on their railroad investments. The railroads are privately owned by the public at large also in the enormous amount of taxation that they pay to the various governmental divisions. The interest of the public in their performance is also reflected by the million employees and their families who are dependent on them for support and of the number of citizens dependent upon those employees through the income which they give to the communities in which they live.

The whole community is furthermore interested in railroad prosperity because of the hundreds of millions they spend each year for materials and supplies, new equipment and facilities which provide employment and wages for hundreds of thousands on the farms and in the factories, industries and ports of the nation. They are owned directly by the citizens themselves and not through the agency of any political body.

## Reduced Rates and Reporting to Public

They are operated by professional managements, men who give their lives to the service and devote themselves to transportation from the time the railroad hires them to the end of their lives, and out of their service they acquire a faith and come to an understanding of their obligations. These obligations are four-fold, as follows: First, to the public which is served; second, to labor which operates the railroads; third, to the people and institutions who have provided the funds invested in the properties; and, fourth, to management itself. Management's obligation to the public consists in providing constantly improved service at relatively decreasing rates and the responsibility to keep the public informed periodically as to the health of the service and as to harmful governmental interference by regulation or statutes. We — all the employees — should give you uniform, efficient, courteous service. Being human, we may make mistakes and should correct them as we find them or as they are called to our attention. We should see that you are informed as to our problems so that you — the public — should have a sympathetic understanding of the questions that must be met and answered.

The subject of railroad labor is as complex as the government itself. Railroad employees of the nation, with their families and dependents, constitute a population equal to that of the larger states of the union. This is one of the main reasons, of itself, why government ownership and government operation of railroads would never be successful, not only from the viewpoint of government and the public, but above all from that of

labor itself. There is no hard and fast line of demarcation between railroad labor and management. Thousands of railroad men over the country, by reason of their positions, are labor one minute and management the next. All management has come from the ranks of labor of one sort or another. All leaders of railroad labor have come from the ranks of labor. The railroad unions, taken as a whole, are the best in the country and the most ably led. Management is promoted labor, and by selection is supposed to be the most efficient of the group; yet it has frailties, of course, and the same human emotions. Railroad labor represents all types, every emotion known to man, and every philosophy known to reason.

## Collective Bargaining vs. Dictatorship

The most efficient, equitable form of relationship between management, with its frailties, and labor, with its emotions, is through collective bargaining. Collective bargaining results in the union of effort on the part of labor to bargain collectively with a union of thought on the part of management, and you can not have collective bargaining without some form of organization, whether it be a labor union or an organization of employees. If labor is unorganized and deals with an arbitrary, not overly efficient management, injustice will be done to labor. If labor is strongly organized and led by arbitrary and not overly efficient leaders, labor loses again. In the earlier days of American transportation, under a feudal system, labor was rewarded for its toil as management determined. This policy was too often carried out by the management in power at the time with the unsatisfactory results that come from dictatorship. On the other hand, with the coming of collective bargaining, came the railroad labor organizations with their attendant shortcomings.

With the organization of American labor into national unions and its growth in political power, the tendency today is a swing in the opposite direction from the feudal system — toward the regimentation of labor by the leaders of labor — men hired by the union to manage its affairs. Labor can get no better conditions under the one autocracy than under the other autocracy. The labor unions are just commencing to demonstrate autocracy through their efforts to secure uneconomic regulations through legislation and restrictions by political force. American railroad labor is entitled to freedom from both the dictatorship of management and the dictatorship of labor spoilers. Freedom to manage its own affairs, to hold its own political views, its own religious views, its own view of unionism, are its inalienable personal rights. Freedom involves responsibilities, and labor should be willing to accept those responsibilities. In its approach to the practice of collective bargaining, it should be concerned with the fulness of life and the rights of fellow-employees rather than entrust all these responsibilities to autocratic leadership.

As management is organized by sectional units, so is railroad labor, by divisions and by territories. As labor assumes its responsibility, it should elect efficient leaders

\* Abstract of an address at the annual meeting of the Harrisburg (Pa.) Chamber of Commerce on October 5.

to bargain with management. Then two groups of men, representing both management and labor, both with equal responsibility, should collectively consider the questions at issue and determine the just and equitable treatment which should be accorded in the interests of harmony and fair dealing.

### Management's Responsibility to Labor

American railroad managements as a whole believe in collective bargaining, but upon their shoulders rests a responsibility to labor beyond that of labor itself. Management has a responsibility to the public that labor shall receive its just rewards, but also shall perform its just service to the public. In this, management should have public support. It has a responsibility that railroad labor leadership shall not lead labor into unsound economic paths, and that it shall not invoke expediency and sacrifice future stability. It has the immediate, direct responsibility of equity to labor and responsibility for the future welfare of labor considered in the light of the economic trends of the day.

When the train and engine service men come to the legislature for train limit and full crew bills, they come politically, on the basis of safety, but, actually, to make more jobs. What they would accomplish in the end would be less jobs, no more safety than heretofore and nothing for the men. It is management's responsibility to the public and labor alike to maintain safety and promote more economical transportation and, by performing service economically, make more work and more jobs. A liberal attitude by labor and management is not a solution of their problems but a way to look at them, and if they will look at them that way and approach them through collective bargaining by representatives deriving their just power from the consent of those represented, then can all the problems be solved with equity and justice; and only through such means can American Labor preserve its personal and economic freedom.

Railroad employees have individual rights, but accomplishment of any difficult task also requires discipline, whether self-imposed or imposed by higher authority. It is the duty of management in any organization built up in the American way to recognize the equal rights of all and to administer individual rights subject to the rights of the whole. Labor, individually or collectively, sees its immediate necessities. Management, on account of its responsibilities to the individual, must see not only his immediate necessities but the necessities of the future and must plan for that future.

Among the responsibilities of management to labor are considerations of the individual's safety, health, morale, contentment, promotion, discipline, and rules and regulations of employment. This situation is peculiarly American — without paternalism, without regimentation, without autocracy, but by negotiation and joint conferring, with liberalism on both sides — management fulfilling its obligations with the assistance and cooperation of labor.

### Investors' Rights Must Be Protected

The great American public owns the American railroads. When the public recognizes the rights of the investor, it not only protects its own rights, but it recognizes the fact that by investment alone can it have transportation service.

Labor, equally with management, should be interested in the investor, for by investment alone have jobs been made possible. Twenty-five thousand dollars is the approximate investment in the railroad to provide a job. It makes no difference whether it is government funds or private funds; that much money had to be put into

the plant to create the job, and, with the progress of the individual's occupation, with competition by other forms of transportation, and the never-ending fight against obsolescence, it is to labor's own interest to guard jealously the rights of the investor. Management, with full recognition of these things, and the play of other economic forces, knows that the investor must be protected equally with the public and labor if all three are to be properly served. In fact, so closely are personal rights and property rights tied together that the separation of one from the other would probably destroy both in a common disaster. It is the public's duty and it is labor's duty to see that management shall have a fair opportunity to perform its duty to the investor.

Management's obligation to itself consists in its duty, without prejudice or favoritism, to select by fitness from the ranks of the employees captains of tens so that they may be trained to be captains of hundreds, that they, in turn, through knowledge, training and experience, may broaden out to become the managers and executives of future years.

### Selecting Future Leaders The Hardest Job of All

It is, perhaps, our most difficult task to select, by fitness of mind, breadth of vision, and capacity, the young men from the ranks who some day will be the managers of American transportation with an ability equal to, or surpassing, that of the great masters who have gone before them, with full recognition of their responsibilities to the public which management serves, the investors it protects, and to the labor it employs and directs. When you realize that some of our best transportation men were college-bred, and that some of our best engineers had little formal education, then you will understand somewhat the problem that faces management in the development of supervision. The philosophy of the Pennsylvania Railroad, and, I believe, the philosophy of all the American railroads is that of "live and let live," a recognition of the rights of all without fear or favor.

## I. C. Starts Employee Training Program\*

A LECTURE and correspondence training program for employees, the first to be undertaken on a large scale by any railroad, was started by the Illinois Central on October 2, with a total voluntary enrollment of more than 1,000 employees, representing practically every department in the railway organization. The entire training program, which is designed to cover a one-year period, will be carried on under the personal direction of Dr. Thor W. Bruce, assistant to the dean of the College of Commerce and Finance of the University of Illinois. It is so arranged that the 561 employees enrolled in and near Chicago will be able to attend lectures, while 445 who are prevented by distance from attending the lectures may take reading or correspondence courses. Lectures on general subjects will be given on Friday evenings, while discussions of railroad subjects by railroad officers will be held on Saturday mornings. The latter meetings will consist of two

(Continued on page 526)

\* The formation of this lecture and correspondence course is the outgrowth of extensive studies of traffic department organization and merchandising conducted during recent years by the traffic department. Articles describing the merchandising methods and new practices adopted by the traffic department and their effects will appear in later issues of the *Railway Age*.



# Labor Conditions in Bus Transport

Report to former Co-ordinator analyzes hours, wages, and working conditions, showing considerable improvement since 1933

WASHINGTON, D. C.

**P**ART of the reason why bus fares can be made lower than those of the railroads is indicated in a comprehensive report on hours, wages, and working conditions in inter-city bus transportation, prepared by the Section of Research and the Section of Labor Relations, with some assistance from the Department of Labor, made public on October 7 by Joseph B. Eastman, former federal co-ordinator of transportation, as part of a series of investigations into labor conditions in various branches of the transportation industry. This report is Part I of the report on inter-city motor transport industries, and is to be followed by Part II on motor truck transportation and Part III on considerations common to motor bus and motor truck transportation.

In a foreword to the report Mr. Eastman says that these investigations were undertaken not only in the belief that the ascertainment and presentation of the essential facts were greatly to be desired but also with the thought that they might to some extent disclose the need for legislation. Since then, however, the motor carrier act, 1935, has become a law and under it the Interstate Commerce Commission now has the power, among other things, to establish reasonable requirements with respect to qualifications and maximum hours of service of employees and safety of operation and equipment of motor carriers. Furthermore, the emergency transportation act of 1933 has expired and the office of federal co-ordinator of transportation has ceased to exist. Because of these circumstances, the report is confined to a presentation of the facts developed by the investigation, with such comment on those facts as deemed pertinent to their consideration. The other parts of the report on inter-city motor transport, will be ready shortly. One reason for the investigation was the claim, made by the railroads, that they are handicapped in competition because labor standards are higher in the railroad industry than in the other forms of transportation, but the comparisons have been left for a later report on "Comparative Labor Standards In Transportation". Following is the summary of Part I;

Intercity transportation by motor bus dates essentially from the war and early post-war years, but its period of expansion into a major agency of transportation goes back no further than about the year 1924. At the outset, runs were short and equipment crude. As experience was gained, highways were improved, and more efficient and attractive equipment was developed, runs lengthened, larger operators emerged, and a nation wide, interrelated system of bus transportation came into being.

On the basis of the latest information obtainable, it may be estimated that approximately 3,500 operators<sup>1</sup> are engaged in furnishing scheduled common-carrier service over an aggregate of some 350,000 miles of route. They employ nearly 25,000 busses, some used interchangeably in scheduled and charter service. At least two-thirds of the operators do not actually move their equipment across state lines, but substantially all participate, though many only infrequently, in interstate business. The bulk of the traffic is handled by a comparatively small number of operators, in many of which the railroads are interested, in certain instances to the extent of complete owner-

ship. Of the estimated total of 3,900 operators in 1934, there were only about 1,300 whose interstate service amounted to any considerable share of their total business. Of these, possibly 500 had one or two employees each while the remaining 800 had a labor force whose hours, wages, and working conditions are reasonably represented by the findings set out in the present report. The intercity operators who, because of their size or their location, participate only infrequently in interstate transportation, or who do only an intrastate business, numbered about 2,600. No attempt has been made to embrace the heterogeneous group of persons who, on an individual and irregular basis, furnish for-hire transportation. Generally, they have no employed labor force.

## The Labor Force

The size of the labor force engaged in intercity bus transportation is as yet a matter of estimate. It appears, however, that the total force employed in 1934 numbered about 36,000, of whom 20,000 or 55 per cent were drivers, 8,500 or 24 per cent maintenance employees, and 7,500, or 21 per cent, station and office employees. Sixty per cent of the operators employ one-tenth of the workers; on the other hand, 5 per cent employ more than half. One-fourth of the companies surveyed had no established maintenance force and three-eighths had no station or office employees. Most of the small operators had their maintenance work done in commercial garages or, in some instances, by the drivers or owners. Similarly, the owners in some instances did the necessary station and office work, or parts of it were performed by connecting lines, by commission agents, or, in a few instances, by terminal or management companies.

Labor costs in 1933 absorbed about 32 per cent of operating revenues and accounted for about 34 per cent of operating expenses, with taxes included, or about 36 per cent with taxes excluded.

Sources of information, explained in detail in the text, comprise field investigations made as of July, 1933, and October, 1935, replies made by railroads for the same months covering their own operations and those in which they had an interest equal to 25 per cent or more of the outstanding capital stock, and certain Code Authority reports for March, 1934. The source designated hereinafter as "1933 railroad bus reports" did not embrace all operations in which the railroads were interested, as some were included in that year's field investigation.

## Hours and Earnings, Labor Force as a Whole

In October, 1935, all employees averaged about 45 hours of work in a week; the earnings of those included in the railroad bus reports averaged \$30.21 in the week or 65.5 cents an hour, and of those covered by the field study, \$26.03 or 58.2 cents. The Code Authority report for March, 1934, indicated slightly higher weekly hours, and average earnings of \$27.58 in a week or 55.8 cents per hour. In July, 1933, weekly hours averaged about 50; weekly earnings of \$28.15 were found in the railroad bus reports and of \$26.52 in the field study of that year; hourly earnings were 56.2 and 53.1 cents, respectively.

## Drivers' Hours and Earnings

Drivers occupy a position of responsibility in the industry. They are classified as regular, relief, and extra. From 80 to 85 per cent of the drivers are assigned to regular runs. Regular drivers were on duty an average of approximately 43 to 44 hours per week in October, 1935, compared with 49 hours in the July, 1933, railroad bus reports and with 51 hours in that month's field study. Their average earnings in a week were \$33.89 and \$27.85 in the respective 1935 studies, or 77.4 and 65.2 cents per hour, compared with \$30.45 in a week, or 62.4 cents an hour, in the 1933 railroad bus reports and \$29.82 per week or 58.4 cents

<sup>1</sup> Estimated as of December 31, 1935. The number of operators estimated as of December 31, 1934, was 3,900.

an hour in that year's field study. About 85 per cent of the time on duty was spent en route. In the July, 1933, field study, regular drivers averaged 6.1 days on duty per week, relief drivers, 5.5 days, and extra drivers, 3.7 days. Per day, the regular drivers averaged 8.4 hours and the relief and extra drivers 8.2 hours. A standard work day of 10 hours or more was maintained by 14 per cent of the companies included in the 1933 field survey and by 20 per cent of those covered in that year's railroad bus reports. With 40 and 50 per cent of the respective groups the standard was 8 hours or more. Of the full-time drivers in the railroad bus reports, 29 per cent were on a standard 8-hour, 40 percent on a 9-hour, and 25 per cent on a 10-hour or longer standard day. Many of the companies have established a standard work day in terms of mileage, including some which also use the time basis. With 44 per cent of those companies, the standard was 200 miles or over and with 3 per cent, 300 miles or over.

Maximum permissible working hours were established by 56 (25 per cent) of the 221 operating companies covered in the 1933 field study. One company out of seven set the maximum

by method of wage payment (mile, trip or time-rate) are developed in the report, as are variations in driver expense of operators serving identical termini and a more direct comparison between the average earnings of drivers in the employ of "railroad" and "independent" operators.

The report develops essential information respecting payment for overtime, bonus and penalty systems, reimbursement of drivers' out-of-pocket expense, vacation and sick leave, and related subjects. Brief mention also is made of the hours and earnings of special employees in bus crews, including bus porters.

### Hours and Earnings of Maintenance Workers

Skilled mechanics comprised about 55 per cent of the maintenance force, and mechanics, foremen and mechanics' helpers about 75 per cent. Cleaners and garage and service employees made up the rest of the force. In the three years for which data were obtained, there were on the average 50 to 60 maintenance workers per 100 employed drivers. Their compensation was about 28 per cent of that paid all employees. As previously stated, one-fourth of the operators surveyed in the 1933 field study had no maintenance payrolls.

In October, 1935, the hours worked by the maintenance force as a whole averaged between 48 and 49 in the week; average weekly earnings in the field study of that year were \$26.56, or 55 cents per hour, and in the railroad bus reports, \$29, or 59.3 cents per hour. The average work-week found in the October, 1935, field study was 6 hours, or 11 per cent shorter than that found in the July, 1933, field study, and earnings per hour were about 7 cents or 14 per cent greater. Little change occurred in weekly earnings. The railroad bus reports showed a decrease of 5 per cent in average weekly hours and increases of 8 and 14 per cent in weekly and hourly earnings, respectively. The changes between 1933 and 1935 appeared to be generally distributed rather than confined to specific areas.

The report shows geographic variations in the hours and earnings of the maintenance force as a whole, and develops in considerable detail the average and range of hours and earnings and other information respecting individual occupations. The report also sets forth information respecting bases of wage payment, payment for overtime, and vacation and sick leave privileges.

### Hours and Earnings of Station and Office Workers

Station and office workers (not including commission agents) accounted for about 21 to 25 per cent of the labor force of intercity bus operators and for 18 to 21 per cent of the payroll expense. Agents and ticket sellers constituted 31 to 40 per cent of the station and office employees covered in the several studies; clerks, stenographers and typists, 19 to 31 per cent; dispatchers, 6 to 8 per cent; bookkeepers, 3 to 8 per cent; and traffic solicitors, 3 to 6 per cent. There were also a number of miscellaneous occupations. Women made up about 25 per cent of the station and office force.

The October, 1935, field survey indicated that the hours worked by all station and office employees, other than superintendents and porters, average 47 in the week and that earnings averaged \$22.25 or 47.3 cents per hour. In the corresponding railroad bus reports the hours were 48.6 and the earnings \$26.00 or 53.5 cents per hour. In the July, 1933, field study, hours were 51 and earnings \$23.52 per week or 46.1 cents per hour; and in the railroad bus reports of the same month, hours were 53.5 and earnings were \$27.01 and 50.5 cents, respectively. In the 2-year period the work-week declined 4 to 5 hours (approximately 9 per cent), average hourly earnings increased 1 to 3 cents (not over 6 per cent), and average weekly earnings fell by a little over \$1.00 (4 to 6 per cent). An average work-week of 6.3 days was found in the 1933 field study.

The report develops in detail the facts respecting variations in hours and earnings between occupations and by geographic regions, bases of wage payment, payment for overtime, and vacation and sick leave privileges.

The report concludes by calling attention to the companion report which summarizes existing state regulations of the hours of service and qualifications of both bus and truck drivers, discusses some aspects of driver fatigue, and traces developments in labor relations in the two branches of intercity motor transportation.

While the report makes no comparison between the

**Table I—Average Hours and Earnings of Drivers, Maintenance, and Station and Office Employees in Intercity Motorbus Operations, 1933-1935**

Occupational group and source	Number of employees	Average hours worked in week	Average earnings in week	Average earnings per hour
<b>All employees:</b>				
1935: Field study (October).....	4,110	44.7	\$26.03	\$0.582
Railroad bus reports (October).....	6,944	46.1	30.21	.655
1934: Code Authority reports (March).....	12,056	49.4	27.58	.558
1933: Field study (July).....	8,784	50.0	26.52	.531
Railroad bus reports (July)....	3,795	50.1	28.15	.562
<b>All drivers:</b>				
1935: Field study (October).....	2,157	41.8	27.09	.648
Railroad bus reports (October).....	3,248	43.1	33.16	.769
1934: Code Authority reports (March).....	6,316	49.3	29.48	.597
1933: Field study (July).....	4,335	47.7	27.82	.583
Railroad bus reports (July)....	1,870	47.8	29.49	.617
<b>Regular drivers:</b>				
1935: Field study (October).....	1,963	42.7	27.85	.652
Railroad bus reports (October).....	2,966	43.8	33.89	.774
1934: Code Authority reports (March).....	5,374	51.5	30.33	.588
1933: Field study (July).....	3,406	51.1	29.82	.584
Railroad bus reports (July)....	1,640	48.8	30.45	.624
<b>Maintenance employees:</b>				
1935: Field study (October).....	1,106	48.3	26.56	.550
Railroad bus reports (October).....	1,992	48.9	29.00	.593
1934: Code Authority reports (March).....	3,172	51.4	27.48	.535
1933: Field study (July).....	2,400	54.1	26.13	.483
Railroad bus reports (July)....	1,097	51.5	26.76	.520
<b>Station and office employees:*</b>				
1935: Field study (October).....	847	47.0	22.25	.473
Railroad bus reports (October).....	1,704	48.6	26.00	.535
1934: Code Authority reports (March).....	2,568	47.1	23.01	.489
1933: Field study (July).....	2,049	51.0	23.52	.461
Railroad bus reports (July)....	828	53.5	27.01	.505

\* Exclusive of superintendents and porters.

at 16 to 20 hours; one out of five at 12; and one out of three at 10 hours.

Drivers' usual consecutive hours on the road ranged from 1 to 11, but in a few instances reached 13. Hours spent consecutively at the wheel ranged generally from less than 1 up to 7. Maximum permissible hours of unbroken driving were reported as less than 8 for about two-thirds of the drivers and as less than 10 for all but 3 per cent of the drivers in 1933 and for all but 9 per cent in 1935.

For 38.3 per cent of the regular drivers the hours worked in the week (in July, 1933) were less than 48; for 39.1 per cent, from 48 up to 60; for 17.9 per cent, from 60 up to 72; and for 4.7 per cent, over 72. In the same month, 13 per cent of the regular drivers earned less than \$20 in the week; 39 per cent, from \$20 up to \$30; 34.7 per cent, from \$30 up to \$40; and 13.3 per cent, \$40 and more. Hourly earnings were under 35 cents for 4.8 per cent of these drivers; 35 up to 50 cents for 22.4 per cent; 50 up to 65 for 36.7 per cent; from 65 up to 85 for 31.1 per cent; and 85 or over for 5 per cent. The range in full-time monthly earnings reported in the 1935 field study was from \$35 to \$253, and from \$50 to \$274 in that year's railroad bus reports.

Variations of drivers' hours and earnings with size of company by which employed, by geographic regions, by size of community in which drivers live or in which their runs started, and



duties of a railroad train or engine employee and those of a bus driver it includes the following as to the requirements of bus drivers:

### Duties of Bus Drivers

By virtue of his duties and responsibilities, the bus driver has in many respects the most significant post among wage earners in the industry. His work calls for exercise of skill and judgment above that required of the general run of drivers of motor vehicles. He must be able to operate equipment which in the majority of instances is large and heavy, over poor roads as well as good, in all kinds of weather, often through congested traffic, with care for the safety and riding comfort of his passengers. He must be able to maintain a schedule without endangering his own passengers and vehicle or the life and limb of other users of the highway. His schedule frequently calls for high and sustained road speeds. Safeguarded by no advance signals or other guarantees of right of way comparable with the safety devices which protect a passenger-train engineer, he must be equally alert to react quickly and surely in emergency.

Moreover, the bus driver in scheduled common-carrier service is conductor as well as chauffeur. He is responsible for ticket-taking, collection and custody of cash fares, delivery of passengers at connection points and destinations, and maintenance of order within his vehicle. He also may have duties in connection with the transportation of newspapers, express parcels

or mail. Several companies require their drivers to be salesmen and count on them to sell a substantial amount of transportation in addition to tickets sold at stations and agencies.

In charter operations the driver's duties are similar in many respects. In addition, the driver of a chartered bus sometimes must maintain a tentative schedule over what may be an unfamiliar route, must act as mechanic in case of trouble, must carefully check his passenger list from time to time, and in most cases must accommodate the operation of his bus to the general desires of his patrons. In some instances he is subject to orders given by his party, who may arbitrarily decide time of departure, layovers, and routes. On the other hand, drivers in charter service sometimes have full days of layover with only such duties as cleaning the equipment, tuning the motor or tire repair to occupy them.

The driver is thrown into close contact with his passengers and inevitably makes an impression upon them, good or bad. Each driver is willy-nilly a traveling general agent for his company, and collectively the drivers are their employers' chief point of contact with their patrons. In consequence, especially in scheduled service, managements have been led to lay upon their drivers a variety of special injunctions and duties, such as rules regulating conduct in the interest of gaining good will, devices for gathering information about the wishes and needs of patrons, and in some instances schemes for selling tickets and extending patrons' use of the line, accompanied by incentives in the way of special bonus payments.

# Steam Railroad Session at National Safety Council Meeting

Ralph Budd and Commissioner McManamy among speakers—Future status of Section discussed

THE 25th national safety congress and exposition of the National Safety Council was held this week at Atlantic City, N. J., with the Council's Steam Railroad Section holding a half-day session on October 7. The program of the latter, over which W. W. Wood, superintendent of safety and welfare for the Baltimore & Ohio, presided, included addresses by Ralph Budd, president of the Chicago, Burlington & Quincy; Commissioner Frank McManamy of the Interstate Commerce Commission; C. H. Paris, chief engineer of the Chicago & Illinois Midland; and A. V. Rohweder, superintendent of safety and welfare for the Duluth, Missabe & Northern.

Mr. Budd spoke on "Management's Responsibility for Safety Work on the Railroad"; Commissioner McManamy on "Safety Today on American Railroads as Viewed by the Interstate Commerce Commission"; Mr. Paris on "Safety in Railroad Construction and Maintenance from the Viewpoint of a Chief Engineer"; and Mr. Rohweder on "Safety on Railroads and Its Relation to Community Safety."

Following the completion of this formal program there developed considerable discussion as to the future status of the National Safety Council's Steam Railroad Section. For the past four years it had been consolidated with the Safety Section of the Association of American Railroads. The board of directors of the latter, however, elected not to renew the consolidation agreement which expired this year. Leading this discussion was John E. Long, superintendent of safety for the Delaware & Hudson and former president of the National Safety Council, who proposed a motion to the effect that it be recorded as the feeling of those attending the meeting that the Steam Railroad Section

of the National Safety Council be again organized, that proper committees be appointed to bring this about and that railroad discussions be continued on programs of National Safety Council meetings.

H. A. Rowe, manager of the claims department of the Delaware, Lackawanna & Western, contended that, in view of the A.A.R.'s action determining the relationship of its Safety Section with the National Safety Council, no person present was authorized to act on Mr. Long's motion. Mr. Long disagreed, however, pointing out that the A.A.R. had merely discontinued its affiliation with the N.S.C. but had said nothing on the continuance of the latter's Steam Railroad Section. Here T. W. Carrow of the Pennsylvania, while expressing sympathy for the point of view reflected in Mr. Long's motion, suggested that the matter be turned over to the committee of direction of the A.A.R. Safety Section. Mr. Carrow as a member of that committee promised to work there for the matter's early consideration. But Mr. Long persisted in his demand for a vote, pointing out again that the motion contemplated "nothing more than an expression of sentiment" in favor of continuing the Steam Railroad Section. Next Mr. Rohweder spoke in favor of the motion in his capacity as vice-president of the National Safety Council. Then came the vote and the motion was carried by a large majority.

The only other proceedings of the meeting were brief discussions of each of the scheduled addresses listed in the foregoing. These addresses are abstracted below.

### Railroad Management and Safety

Mr. Budd divided his address into three parts, discussing in turn those safety activities which depend upon co-operation of employees; those which are the

sole responsibility of management; and finally the desirability of the public taking a greater interest in safety matters. The railroads, he asserted at the outset, "are justly proud of their safety record"—in a period of remarkable developments in transport "riding in a passenger train is about the safest thing one can do," and, while running a locomotive "was once considered hazardous employment," engineers are now "noted for their longevity." This high degree of safety, he continued, has been attained "notwithstanding a combination of most difficult circumstances," such as the depression, the demand for improved service, the struggle for traffic, and the need for operating economies.

From a managerial standpoint, Mr. Budd went on, safety is a matter of policy and responsibility for the policy rests primarily on the chief executive. He pointed out in this connection how management, "actuated by humanitarian as well as what may be termed an enlightened self-interest, has made safety a watchword"—how it "has set for itself a standard higher than required by technical legal liability, the purpose being to maintain and operate the railroads in such manner that there shall be no injuries to passengers or employees, and no damage to property."

The speaker next explained how accident prevention by co-operation between men and management has been promoted through safety meetings, the enthusiasm at which "speaks conclusively for the attitude of the men." Recalling at this point the saying, "the best safety device is a careful workman," Mr. Budd added that "experience has shown that the best device for making more workmen habitually more careful is a good safety department, well supported by management."

It was Mr. Budd's next observation that each unit of property design, built and maintained for a specific purpose, presents its own safety problem. He pointed out in this connection that "it is by no means essential to safety that the latest types of equipment, the newest inventions or the highest quality of track should be provided at all times and all places." It is, however, "essential that the adopted standards be proper for the demands and requirements of the service"—the railroad is a vast aggregation of units of all kinds of physical property, and "if each unit is operated consistently with its capabilities and limitations, the operation is safe."

#### Speed Calls for Special Attention to Safety

Coming to his survey of the field wherein safety is the sole responsibility of management Mr. Budd discussed recent developments "in bettering the physical plant and advancing railway operation, particularly in speed and efficiency." The great improvement in passenger and freight service, he said, "has called for special managerial attention to safety." He next referred to recent observations made by W. J. Patterson, director, Bureau of Safety, Interstate Commerce Commission, and published in the *Railway Age* of August 1. Calling Mr. Patterson's observations "perhaps the most significant statement" concerning recent improvements in railway service, Mr. Budd proceeded to discuss in turn the four phases of railway operation which the Director of the Bureau of Safety had said "required careful attention in connection with the handling of faster trains." These four phases are: Track, signals, brakes and equipment.

As for track, Mr. Budd said, "what was and is involved is a careful appraisal of the characteristics of each stretch of track, and a careful laying out of schedules to suit actual track conditions; then a constant watchfulness to make certain that the condition which is suitable for the scheduled speed is always maintained." While, he added, several rather essential things have

been done to track, "all of them have followed well-known engineering principles and practices." He referred briefly to track adjustments which have been found necessary to accommodate high speed trains, finding "evidence that the problem not only is well understood but is being capably handled," in the fact that "with all of the high speed operation that has taken place in the last two and a half years there has not been a single derailment due to track conditions."

Likewise with signaling, Mr. Budd explained "there is no new principle of engineering involved, but the signals must be so located that the highest speed trains can be stopped in the distances available, having, of course, due regard for grades, allowable braking ratio, and, more particularly, what it is known can be done in actual practice in the way of retardation of the particular train involved."

Also, the subject of brakes has not been overlooked by management, Mr. Budd asserted as he cited brake tests conducted with high-speed trains, which tests "have furnished the basis for further engineering development of the brake art." Here again, he repeated, "safety depends upon a proper understanding of the characteristics of the particular train at various speeds, and also upon skillful handling of the train"—that railroad men and management "have this understanding and skill is evidenced by several million miles of safe, high-speed train operation."

Turning to the fourth question raised by Mr. Patterson—equipment—Mr. Budd listed the various types of high-speed trains, new and rebuilt. He observed in this connection that "so long as sound engineering and high quality of construction are used, there does not seem to be any reason why they should not all be safe," and he is confident that "all of the railroads which have built these trains have had in mind" the points mentioned by Mr. Patterson. The Zephyrs, as designed and constructed, he said, "fully comply with all the requirements of the railway mail service strength specifications, which have been followed for many years in building not only mail cars but passenger cars as well."

Referring to the speed capabilities of the new trains Mr. Budd said that, while they have set new railroad records and their test performances have been spectacular, it is surprising as to their actual service runs how little increase in maximum speed has been required to maintain the fast schedules. The old schedules, he explained, called for high speed for short distances but much time was lost stopping and starting, refueling, doing station work, etc. Thus their performance curves are "successions of peaks and deep valleys, resulting in an average speed about midway between maximum and zero." The performance curves of the new trains, on the other hand, "show fewer valleys and smaller ones, and the average speed is more than two thirds of the maximum. Frequently maximum speed of the new trains is only 10 or 12 m.p.h. faster than that of the old, but the average speed between terminals is increased by 25 m.p.h."

#### Safety Requires Enforcement of Traffic Laws

The remainder of Mr. Budd's remarks referred to the public's interest in safety matters—particularly highway safety. He pointed out that although "less than 5 per cent of motor accidents occur at railroad crossings," the railroads, like the general public, "suffer from the careless motorist." He referred to crossing accidents wherein trains have been derailed and railroad employees killed or injured. Although he called grade separation the ideal solution, he reminded his audience that all crossings cannot be eliminated for many years and thus the



problem must be dealt with "by utilizing existing facilities in the safest possible manner." This, he said, requires co-operation of the public—particularly those operating motor vehicles. Mr. Budd cited in the latter connection two serious grade crossing accidents wherein gasoline trucks had been struck by trains with resulting fires. Investigation of one showed that not only had the driver of the truck failed to observe the law requiring him to stop on approaching the crossing, but that neither he nor his employer knew of such a law. The I.C.C. recommended that local authorities take effective steps to enforce the law but the latter were without funds to police enforcement. Hence Mr. Budd's observation that laws designed to protect the public against death and injury in motor vehicle accidents "are futile unless there is adequate provision for policing of the highways."

#### The I.C.C. and Railroad Safety

Commissioner McManamy brought from the I.C.C. "cordial good wishes and assurances of continued sincere and hearty co-operation in the great work in which the National Safety Council is engaged." He then proceeded to give a brief history of the activities of the commission in the interest of safety on American railroads, pointing out, however, that any views expressed would be his own and not those of the commission.

Sketching briefly the beginning of the safety movement on railroads, Mr. McManamy pointed out that even before the commission's existence "the need for protection of employees engaged in the then extra hazardous occupation of operating trains" had attracted the attention of humanitarians throughout the country; that in 1871 Senator Sumner of Massachusetts introduced into Congress a resolution providing for an investigation of the problem; and that in 1889 President Harrison, in his first message to Congress, urged that legislation be enacted to protect railroad employees. This recommendation was repeated in 1890 and again in 1891, a number of states meanwhile having enacted such legislation. Because of the lack of uniformity in them, and their failure to bring about standardization of railroad equipment, these state laws, Mr. McManamy said, "often created additional hazard." Thus all parties turned for relief to the Interstate Commerce Commission, which had been created in 1887.

The commission's first step, he recalled, was to summon in 1889 a conference of state commissioners, which conference adopted a resolution requesting the commission to make such recommendations to the railroads and to Congress as it might consider proper and necessary. Then, after receiving replies to a questionnaire, the commission embodied in its first report to Congress recommendations for the promotion of safety; and, Mr. McManamy added, "subsequent annual reports almost without exception have contained further recommendations with respect to safety, most of which have been enacted into law." Thus, he went on, the duties of the commission with respect to the promotion of safety on railroads "are prescribed by a series of separate laws enacted by the Congress at different times, most of which were in response to urgent demands by the railroad employees for protective legislation."

Next Mr. McManamy listed these various safety laws, explaining briefly the general purpose of each. Included in his listing was the safety appliance act of 1893, requiring power-driven brakes, automatic couplers and grab irons, and its 1910 amendment requiring additional appliances such as hand brakes, ladders, running boards and sill steps; the medals of honor act of 1905 extending Congressional recognition to those endangering their own lives in saving or endeavoring to save lives from

railroad accidents, or in preventing or endeavoring to prevent such accidents; the hours of service act of 1907; the ash pan act of 1908, which made it unlawful to use in interstate commerce any locomotive not equipped with an ash pan which can be dumped or emptied and cleaned without the necessity of an employee going under the locomotive; the transportation of explosives act of 1908 and its 1921 amendment to include inflammables and other dangerous articles, both of which "contrary to the usual procedure" were advocated by the railroads; the accident reports act of 1910; the boiler inspection act of 1911; and section 26 of the interstate commerce act which was enacted in 1920 to give the commission authority to require carriers to install automatic train-stop or train-control devices.

#### Laws Have Promoted Safety and Efficiency

"The results of these laws," Mr. McManamy said, "have been two-fold: That they have promoted safety in large measure is abundantly proven; that they have been equally effective in promoting efficiency in railroad operation is not now questioned." Many of the devices required by law, he continued, were workable when the laws were passed and thus "they would no doubt have eventually come into general use." Yet he thinks that "the experience of the carriers in their efforts to regulate the transportation of explosives proves that it would only have come about after a long period of years and even then the degree of uniformity and standardization necessary to provide adequate safety would have been lacking."

After the foregoing resumé Mr. McManamy recalled how "for more than two decades the commission labored under difficulties in its work to promote safety," there being no regular safety movement as at present. "Safety agents or superintendents of safety on railroads," he added, "had not even been suggested" in those times when from his own experience he remembered how "railroad employees who would take the greatest chances in the interests of expediting their work were considered the best employees." To show how far safety work has since advanced the speaker pointed out that in 1890 out of a total of 749,301 railroad employees 2,451 were killed in the performance of their duties, whereas in 1935 this had been reduced to 600 killed out of 1,013,654 employees; in 1890 one passenger was killed for each 41,426,000 miles traveled, while in 1935 one passenger was killed for each 616,983,000 miles traveled. Furthermore, in the latter year "not a single passenger was killed in a collision or derailment."

Mr. McManamy does not attribute to the I.C.C. regulations all the improvement in safety on railroads—"far from it"; but he did say that "in so far as the particular devices and practices covered by these regulations are concerned, they have proven a pretty complete remedy and have also helped to make railroad officials and employees safety conscious." The commission, he continued, has always sought the co-operation of railroad officers and employees in its safety work, and "for more than a quarter of a century it has received such co-operation to a remarkable degree. The results show conclusively that at the present time travel by railroad is the safest known means of transportation"—a statement which, he added, is not news but which nevertheless calls for frequent repetition.

Mr. McManamy next referred briefly to the new duties in connection with safety on the highway which have come to the commission through the motor carrier act. In closing he cautioned against any assumption from his remarks that "the question of safety on railroads has been solved for all time." Safety problems, he said in

this connection, have in the past been met as they arose, and such must be the future course if reasonable safety is to be provided while transportation is passing through its present evolution, or "revolution," one phase of which is the meeting of "the public desire or craze" for speed. Citing the statistics of grade crossing accidents and pointing out by example how fast trains increase this hazard he suggested that the only remedy for such a situation is grade separation, which "should be the immediate objective" wherever high-speed trains are operated.

#### **Safety in Maintenance of Way Department**

Mr. Paris opened with references to Accident Bulletin No. 103 of the Interstate Commerce Commission, which shows, in table No. 55, casualties by classes of employees and other persons in non-train accidents. He cited in this connection the maintenance of way department casualty rate for the 10-year period, 1924-1934, which, he pointed out, was greater than the casualty rate for all employees on duty. In 1934, for example, it was 8.06 casualties per million man hours worked while the rate for all employees was 7.04; also, in that year the spread between the lowest and the highest rates for the maintenance of way department was from 0 to 89.11.

From these and other similar figures Mr. Paris reasoned that the maintenance of way department has a safety problem resulting from a casualty rate which is "too high and too widely divergent as between the different carriers." He proceeded to discuss in turn the four principal causes of injury to maintenance of way department employees—handling rail, ties, timber, etc.; falls; using hand tools, jacks, etc.; motor and hand car accidents—and found in each instance that injuries due to failure of equipment and tools are rare. Throughout the four, however, "runs the taint of poor supervision, poor training, carelessness or some other trait dependent on the human element." Thus Mr. Paris turned to a closer examination of the human element, pointing out how I.C.C. accident report No. 103 shows that "out of 6,000 train accidents in 1934, costing \$7,600,000, 30 per cent were due to negligence of employees;" and how the I.C.C. has stated that "85 per cent of all accidents are due to the human element."

#### **Human Element Predominant**

Such predominance of the human element convinces Mr. Paris that the maintenance of way department safety problem "resolves itself into one of 'personnel administration' rather than one of improvement in tools, equipment and materials." With the job of creating safety consciousness "pretty well done," he thinks that "if we are now to place the work on a still higher plane, we must begin to set up our statistical data accordingly." Hence, after citing as an example the casualty rates which Lew Palmer of the Equitable Life Assurance Society set up 14 years ago as a yard stick for comparisons between railroads, the speaker asked "Is it not time to set up still another yard stick for the measurement of results in terms of the human element, that is 'man failures' and 'supervision failures'?" It has been Mr. Paris' observation that "high accident frequency is a very good barometer of low man power performance;" and, since "the common word for good performance is efficiency, efficiency and low casualty rates go together." Thus the question becomes "one of whether high or low standards of efficiency are desirable.

In order to secure the desired efficiency, Mr. Paris continued, a railroad should strive to awaken the "combined potential ability lying dormant in its groups of

employees." And this can be done by recognizing that employees are eager to advance their company's interests, but, being human, they crave some recognition which indicates that their efforts are appreciated; and by realizing that however kindly disposed chief executives may be, such an attitude is lost on an employee who is contacted "by some surly, uninformed" intermediate superior. "Too many men in supervisory positions," the speaker next observed, "lack training in the technique of their job. This lack of adequate supervision and training in supervisory positions is a contributing factor to this 85 per cent of accidents due to man failures."

#### **Reports Do Not Expose Human Failures**

Furthermore, alongside the present emphasis placed on the improvement of material, tools and equipment, Mr. Paris deplored the lack of data which precludes a railroad's knowing "how many of our accidents are due to 'man failures' or to 'supervision failures';" also, he criticized the situation wherein "we set up rigid specifications" for material but "when we employ men in the maintenance of way department we too often have no specifications at all."

Turning to specific suggestions for an adjustment of the accident reporting system, Mr. Paris would first make a standard classification of non-train accidents in the maintenance of way department. Then, he continued, there should be shown opposite each class of accident the proper charge against either the human element or the physical plant—the human element to be subdivided between man failures and supervision failures. It is his view that "correct and standardized statistical data of this kind will enable those roads adopting definite plans of employee improvement to gage their work the same as we now gage our general safety performance by means of the general casualty rate." He feels certain that department heads do not now "appreciate the importance of setting up a definite classification of causes of accidents, in order that we may bring before our managements the fact that our investment in man power is far greater than our investment in physical property, and is therefore entitled to much more consideration in the matter of training."

As an example of the foregoing Mr. Paris pointed out how an engine failure which results in setting aside an \$80,000 investment causes real concern. Yet, he asks, "What about the foreman in a shop having 100 men earning an average of \$100 a month? This represents an annual income of \$120,000 and, capitalized at 6 per cent, represents an investment of \$2,000,000 in man power. The \$80,000 investment in a locomotive is only the equivalent of the investment in four men capitalized as above."

#### **Safety One of Greatest Cards in Railroad Deck**

"Safety," Mr. Paris concluded, "is one of the greatest cards in the railroad deck, but one cannot provide safety for the public unless he also provides safety for the employee, because safety is primarily an attitude of mind that must be cultivated and developed. It is a matter of training and education. It is a matter of supervision, and, furthermore, it is a matter of policy. Safety starts at the top and is reflected all the way down the line in exact accordance with the backing received from the management. If we are to place our safety work on the new higher ground it must occupy in order to follow the new trend of railroad development, we must place the emphasis on employee improvement, in proportion to the relative position that the employees hold in comparison with the position held by the physical property, as I have



outlined. The new objective could very well be the 'building of men.'

#### Railroad Safety's Relation to Community Safety

Mr. Rohweder first expressed the pride of railroad men in the achievements of the railroads "in conserving the lives and limbs of our employees and passengers." These achievements, he added, have resulted from many years of progress. They did not "just happen"—rather they have come from "years of hard, sincere, conscientious effort" on the part of the managements in co-operation with employees and such agencies as the A. A. R. Safety Section, the I. C. C., the National Safety Council, the American Museum of Safety and various state bodies.

Among the many problems which "are difficult for the safety organizations and railroad managements to combat," Mr. Rohweder listed first those created by the trespasser. The present situation wherein many attempt to steal-rides on trains, wherein children, fascinated by railroading, are attracted onto railroad property, etc., "has created a hazard which is costing the lives and limbs of Americans." Next he listed the grade crossing problem which, he said, the railroads have mitigated materially with their constant "battle cry"—Cross Crossings Cautiously.

Mr. Rohweder continued to point out how railroad safety officers have promoted community safety by talks to civic and fraternal groups, and radio addresses. He then proceeded to urge the necessity for greater activity in the foregoing connection, citing as an example recent intensified work along that line in Minnesota. It was his expressed desire "to impress on the mind of every railroad manager and safety officer the fact that there is an unusual opportunity now being afforded them to attack the trespasser and the railroad grade crossing problems through their active support and co-operation with the state and local safety councils throughout this nation."

#### Community Safety Work a Public Relations Opportunity

The speaker stressed also the "public relations opportunity" in community safety work as he called upon his audience to visualize the results "in good-will" that flow to railroads which assume leadership in movements to conserve life, "whether it be on a railroad, a street or highway, a farm or in a home."

"Let me point out," he continued in the latter connection, "that the loss to railroads is felt just as keenly in a shop or an enginehouse, whether the employee is killed in the service of the railroad or in the crash of a motor vehicle. We as railroad officers have no right to expect that we can make our employees safe only for the time of their regular shift, but if we are to do a proper job, we will make them safety minded and safety conscious through all their activities."

#### Freight Car Loading

(Continued from page 513)

increase over the previous week was 174 and 4,069 over last year, according to the compilation of the Dominion Bureau of Statistics.

	Total Cars Loaded	Total Cars Rec'd from Connections
Total for Canada:		
September 26, 1936.....	59,835	23,134
September 19, 1936.....	59,661	22,675
September 12, 1936.....	52,909	19,427
September 28, 1935.....	55,766	22,102
Cumulative Totals for Canada:		
September 26, 1936.....	1,789,022	892,691
September 28, 1935.....	1,716,748	823,775
September 29, 1934.....	1,699,210	848,970

## Rock Island to Buy Six Streamlined Trains

THE Chicago, Rock Island & Pacific, subject to the approval of the federal district court and the Interstate Commerce Commission, will purchase six light-weight streamlined trains at a cost of approximately \$2,250,000. The plans, which are not as yet fully developed, provide for the operation of one train between Chicago and Peoria, Ill., on a round trip schedule, tentatively set at 2 hr. 45 min. in each direction; one train between Chicago and Des Moines, Iowa, on a round trip schedule of 6 hr. in each direction; two trains between Kansas City, Mo., and the Twin Cities on a schedule of 8 hr.; and two trains between Kansas City and Denver, Colo., on a schedule of 11 or 12 hr. It is planned to establish the new trains early in 1937.

To determine the type of equipment to be purchased alternative bids have been asked on aluminum and stainless steel and Diesel-electric and steam motive power for three and four car trains.

E. M. Durham, Jr., chief executive office, in commenting on the Rock Island's streamline program, said, "We hope to make this new equipment the last word in safety and comfort and in modern accessories and conveniences. These new trains are a part of the program of the Rock Island to improve its service and facilities. We feel the recent development in streamline, air-conditioned equipment has proven popular with the public, and the Rock Island proposes to do its share in that direction."

## Chicago "Fan" Excursion Brings Out 472 Customers

(Continued from page 516)

of the excursionists around the grounds and through the 42-stall enginehouse, explaining essential features of the terminal and of the locomotives on view, and answering the multitude of questions that were asked. Incidentally the questioning of the guides afforded an excellent opportunity for the more technically minded fans to demonstrate their knowledge of railroad and locomotive lore to their less well informed companions. Keen interest was manifested in locomotives in the enginehouse that were in various stages of repair, on some of which external parts had been removed to disclose the mechanism on the interiors of the steam chests, cylinders, smoke boxes, etc. Much curiosity was manifested in the turntable, which, with a locomotive spotted on it, was kept almost constantly in motion. Here again cameras were much in evidence. Following the inspection at Ft. Wayne, the excursionists, by now thoroughly saturated with railroad lore, boarded the train for the final lap of the journey.

At this point the tempo of the excursion suddenly quickened. Whereas the trip to Ft. Wayne had been made leisurely, on the return trip, which it had been advertised would be made on the schedule of the Detroit Arrow of the Pennsylvania, the passengers were introduced to the present-day conception of speed as applied to railroad passenger trains. Drawn by two K-4S (heavy Pacific) engines, which had been substituted for the lighter equipment at Ft. Wayne, the train traveled 141

miles to Englewood Station, Chicago, in 1 hr. 52 min., an average of 75 miles per hour, thus exceeding the schedule of the Detroit Arrow by 3 min. During this phase of the excursion cameras were set aside in favor of timepieces and many of the passengers "clocked" the train, eagerly watching for mile posts and comparing the results of their observations.

Luncheon, at \$1, and short orders were served in the diners, while sandwich, beverage and dessert service was available throughout the train.

An interesting sidelight of the trip was the brief stop made at Liberty Mills, Ind., a small town which is celebrating its one-hundredth anniversary. At this point the passengers manifested keen interest in an old covered bridge located about a quarter of a mile from the railroad tracks and many of them took advantage of the stop to photograph and inspect the structure at close range. At this stop, as at all others made on the trip, it was noticeable that the passengers, becoming deeply interested in their surroundings, were reluctant to return to the train, and it was necessary to resort to insistent sounding of the locomotive whistles to remind them that time was limited.

The passengers on the trip were largely men and boys, although there was a generous sprinkling of women in the group. While the majority appeared to have a deep and genuine interest in railroads, it was evident that not an insignificant number of them made the trip simply for the outing and the change of scenery that it afforded. Curiously enough, the group included about 15 employees of the Pennsylvania, each of whom paid the full fare for the privilege of taking the trip.

That the interest of the passengers was sustained to the last was evidenced by the fact that many of them, after the train had arrived at the Chicago Union Station, gathered about the locomotives to obtain the autographs of the engine crews.

## I. C. Employee Training Program

(Continued from page 518)

sessions, the first comprising a lecture on some technical feature of railroading while at the second session Dr. Bruce will direct a classroom discussion of the points covered in that lecture and in the one on fundamentals delivered the preceding evening.

This training program is an outgrowth of an apprenticeship course which has been conducted in the traffic department for the last five years with satisfactory results. The program was developed by C. C. Cameron, vice-president in charge of traffic, in co-operation with Dr. Charles M. Thompson, dean of the College of Commerce and Finance of the University of Illinois, and Dr. Thor W. Bruce, assistant to the dean, who wrote the syllabus for the course. In the beginning the plan contemplated no other students than traffic department apprentices and beginner employees, numbering about 50 young men, but as the program assumed shape demands from other departments became so great that the program was expanded to permit the enrollment of all employees. The lectures of the course are divided into two general classifications—one a series to be delivered by professional educators on textbook subjects, the other a series on technical phases of railroading by officers in the Illinois Central's own organization. Classroom discussions will follow each lecture.

The first session was held on October 2 in the auditorium of the International House of the University of

Chicago. Dean Thompson described the purpose of the course, while L. A. Downs, president of the Illinois Central, and other officers expressed the willingness of the management to assist employees in improving themselves and the railroad. Succeeding lectures will be given in the theater of the Chicago Women's Club, near the main office building and Central station.

The lectures, to be given by professional educators on Fridays, will include the following subjects: Essentials of Co-operation, Effective Public Speaking, Effective Salesmanship, Marketing Principles That a Railway Employee Should Know, Business Letter Writing, Personality and Civic and Community Responsibilities. Each of these will be discussed by a speaker drawn from some university. Those who have already accepted invitations to speak in this series are Professor Fred H. Russell, Professor C. R. Anderson, Professor Paul Converse, Dean Thompson and Assistant Dean Bruce, all of the University of Illinois.

The subjects which Illinois Central men will discuss on Saturday mornings will cover several phases of railroad operation, with traffic matters dominating the program. The history, geography and organization of the System will be discussed on the first three Saturdays of the course, while the functions of each department of the railroad will be described later in the course. Among the freight traffic subjects to be discussed are tariffs, the Chicago switching district, trap doors and peddler cars, rates and transit on grain and products, cotton handling, procedure before commissions, movement trends of major commodities and perishable traffic.

## Communications . . .

*The Railway Age cannot publish letters from readers who do not supply their names and addresses. Names of correspondents are not published, or disclosed even upon inquiry, unless the correspondent consents. But they must be given us as an evidence of good faith.*

## Riding Qualities of Passenger Cars

TO THE EDITOR:

Dr. Giesl-Gieslingen has done the railroads excellent service in reopening the subject of riding comfort.\* The following notes on observations and experiments may be of interest in this connection.

The formula he gives for frictional resistance is the one given by M. Georges Marié.† It is not based on an exact theory; and, although it is useful for some purposes, it does not correctly represent the influence of friction through a complete cycle. Tests indicate that the coefficient of friction is reduced in the region of the reversal of motion. For example, a lubricated double-elliptic spring, loaded to 16,250 lb., showed a distinct increase in height on the removal of only 250 lb. It is probable that in very rapid oscillations friction is less throughout the cycle than is shown by static tests.

Apparatus that was applied to record simultaneously the relative motions of the equalizer, the truck frame, and the car body, on a car having stiff, dry bolster springs, showed that the bolster spring was constantly functioning with an amplitude about twice that of the equalizer springs. At least two rates of vibration can usually be perceived. They are so combined in all relative phases that the oscillation curve shows an ever-changing wave form. The fastest of these are too rapid to account for even by assuming that the bolster springs are inactive.

The explanation of these rapid vibrations is suggested by Karl Arnstein in his description of the trucks of the "Comet,"‡ where

\* *Railway Age*, August 8, 1936.

† *Traité de Stabilité du Matériel des Chemins de Fer*.

‡ *Mechanical Engineering*, September, 1935.



he says, "It is therefore favorable to reduce the truck-frame weight and to soften the journal springs without coming into the critical range or permitting too much roll."

The diagram submitted by Dr. Giesel-Gieslingen shows the effect of the rapidity of the oscillations. It shows, for example, that three oscillations per second, of about one-eighth inch amplitude, are no more noticeable than five oscillations of about 0.022 in. amplitude. The frequency depends on the initial deflection, the formula for which is

$$d = \frac{K l^3 P}{t^3 w n}, \text{ where}$$

$d$  = the deflection  
 $K$  = a constant  
 $l$  = the length  
 $P$  = the load  
 $t$  = thickness of the leaves  
 $w$  = the width of the leaves  
 $n$  = the number of leaves

With the load and stress fixed, any change in any one of the factors involves change in at least one other, and all factors except the width of the leaves are also factors in the relative friction formula. The designer generally has but limited control over the width and must depend mostly upon adjusting the other factors to get the desired initial deflection. According to formula, these changes increase friction. For example, a decrease in the thickness of the leaves necessitates an increase in their number, according to formula increasing the friction. But commonly, if not invariably, increase in initial deflection obtained by decrease in the thickness of the plates, and increase in the number of them, adds to riding comfort.

A computation of the coefficient of friction from the results of tests of a large number of springs shows a trend toward a decrease with thinner leaves. Probably, however, the springs with the thinner leaves were fitted better. The whole subject of friction in springs—the effects of varying dimensions, periodicity, fitting, kind of lubricant, length of service—needs investigation. Perhaps it may become customary eventually to specify a limit of friction in making purchases.

Before adopting the Swedish truck illustrated in the article referred to, American engineers should consider these features. The substitution of a semi-elliptic spring for a full elliptic one of the same sizes of leaves halves the deflection. The bolster spring shown is a single one, since it is impracticable to use such a wide bundle of springs as are common in American trucks. The thickness of the leaves, then, must be sufficient not only to make up for the length, but also for the narrowness. As the thickness is a factor in the formula for friction, it is hard to see any advantage in the long, narrow, semi-elliptic bolster spring.

Certainly we should not be satisfied with the present American truck. A better one must be possible to design when all the principles are understood. The following requirements are suggested: (1) High initial deflection, with some obvious limitations, (2) minimum weight of truck frame and attached parts, (3) minimum friction consistent with sufficient deflection and damping.

A long wheelbase spreads the springs supporting the truck frame and reduces its angular oscillations. No other benefit of long wheel base is apparent.

G. E.

## The Mechanical Engineer in Railroad

CHICAGO, ILL.

TO THE EDITOR:

There was a time when railroading was a profession that required more than anything else, the ability of men to get things done regardless of the efficiency with which they were done. It was the era of the pioneers that built and operated railroads under many difficulties of various kinds, difficulties which, to overcome, required much brawn as well as brain. It was the era of venturesome men in railroading, who had the opportunity of accomplishing gratifying economic results for themselves or the capitalists who hired them.

Ever since it came to pass that the people of the nation, of the states, counties and cities began to regard railroads as public utilities, insisted upon meddling with private initiative and deter-

mined to curb the capitalist in obtaining fullest fruition from his venture; ever since it came to pass that railroad labor organized itself into a self conscious and aggressive group, the railroad business has passed into a new phase. The economic advantage which the monopoly of rail transportation gave to the early railroaders is, moreover, fast vanishing before the onslaught of competition by other means of transport.

In view of this change in the conditions under which railroads now have to operate and still have to try to pay a return upon privately invested capital, would it not be well for railroad managements to reconsider the part which they might give to the mechanical engineer. The latter is, by his training, competent to add something valuable to the solution of mechanical department problems, of some of the operating, and of some of the purchasing problems.

By mechanical engineer is here meant, not the man who happened to go through a technical school, who promptly forgot his physics and mathematics, and who, not being by temperament and personality fitted for introspective analytical work, used his mechanical engineer's degree as a stepping stone to become a salesman, an operating man or an executive. By mechanical engineer is here meant the man who loves mechanical engineering as such, develops himself in it to a high degree, and thus becomes most competent in analyzing technical problems, of design, of strength of materials, of possible operating results. Such men become introverts by their avocation, even if they are not born that way. They are thinkers and not doers, and they have to be used and respected as thinkers. The executive and managerial type of railroad men often refers to them as "pencil or slide rule pushers," and this designation is largely characteristic of the little esteem in which this type of technically trained man has been held in railroad organizations.

On several occasions in the past, the chances for advancement of the technical man on railroads were freely discussed in these very columns, and a review of the opinions then expressed by "evidently practical" railroad men, distinctly shows how little the value of trained engineering brains for the improvement of the railroad industry is really appreciated. As pointed out above, it is easily understood why the early railroaders had no use for introspect types, or for men of outspokenly analytical faculties. Their railroads had plenty of money that they spent freely with the railway supply industries, which latter furnished the engineering brains and research activities: as a result thereof, it created institutions whose advice the practical railroad accepted without questioning.

But, as the railroad business became harder and harder, as expenditures had to be more and more closely scrutinized, and as, at the same time, cars, locomotives, and shops became more complicated operating instruments as a result of having to take advantage of advanced engineering, the relations between the railroads and the railway supply industry also became more complicated, and the railroads had to develop, more than before, within their own organization, the critical faculties which alone make purposeful and intelligent buying possible, which make it possible to separate the wheat from the chaff, as it were, in selecting for the most economical operation of the roads, designs and devices, from among those that were plentifully offered in free competition, which had the greatest intrinsic engineering value.

Considering the public utility character of the railroad transportation industry, and the supreme need for highest efficiency, there seems to be too great a complexity of the mechanical picture. Apparatus and methods that are freely endorsed by the mechanical departments of some railroads, are just as freely rejected by those of others, and for years efforts at standardization have encountered stubborn opposition. Opinions and impressions on the part of the managerial type of executive have over-shadowed fact findings on the part of the "pencil pushers." This condition of affairs has been both a boon to the railway supply industry, inasmuch as it stimulated a vast competitive effort in creation, and an expense to the railroads insofar as this competitive effort has increased the costs of the railway supply manufacturers.

The creation of a research organization by the A.R.A. is most timely. The railroads will however benefit from it only in the measure in which they admit to their councils competent engineers capable of judging the import of the various results of systematic research.

RESEARCHER.

# NEWS

## Eight Months Railway Net a Return of 2.3 Per Cent

\$364,697,978 an increase of 38.2 per cent over last year. August net up 53.4 per cent

Class I railroads in the first eight months of 1936 had a net railway operating income of \$364,697,978, which was at the annual rate of return of 2.30 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics of the Association of American Railroads. This was an increase of 38.2 per cent as compared with the first eight months of 1935, when the net railway operating income was \$263,852,503 or 1.66 per cent on the property

district and eleven in the western district.

Class I railroads for August had a net railway operating income of \$64,680,717, which, for that month, was at the rate of 2.28 per cent. This was an increase of 53.4 per cent over August, 1935, when the net was \$42,156,706, or 1.48 per cent. In August, 1930, it was \$96,017,672, or 3.33 per cent. Operating revenues for August amounted to \$350,584,820, compared with \$293,989,543 in August, 1935, and \$466,442,467 in August, 1930. Operating expenses in August totaled \$246,299,475, compared with \$221,353,466 in August, 1935, and \$327,250,055 in August, 1930.

Class I railroads in the eastern district for the eight months had a net of \$228,596,865, at the rate of 2.91 per cent. For the same period in 1935, their net was \$182,334,828, or 2.32 per cent, and for the same period in 1930 it was \$304,518,751,

## A.A.R. Proposes Class Rate Simplification

Seeks adjustment which will partially offset loss of surcharge on Dec. 31

Proposals for adjustments in the freight rate structure, to take effect upon the expiration, on December 31, 1936, of the emergency charges now in effect, have been practically completed by special committees representing the railroads, and were discussed with committees appointed by the National Industrial Traffic League and with representatives of both the anthracite and bituminous coal associations at a meeting in Washington on October 1.

These proposals, which will be submitted to the Interstate Commerce Commission and the various state commissions, do not contemplate that the increases authorized by the commission in Ex Parte 115, and now in effect, shall be carried into the freight tariffs. They represent an attempt on the part of the railroads, after a close study of the freight rate structure, to work out such adjustments, through increases and reductions, as will partially offset the decrease in revenues which otherwise will take place when the present charges expire at the end of this year.

As part of the general adjustment, the railroads contemplate an important step toward simplicity by making practically uniform for the entire country the classification of all articles now moving on first, second, and third class rates in less than car load lots in each of the three major traffic territories, Official, Western and Southern. This result is to be accomplished in practically all instances by making the ratings in all territories the same as the lowest classification now in effect in any territory. This is looked upon as the most important single step ever taken toward simplification and uniformity in the freight rate structure.

No general increases in the class rates will be proposed except that in official territory, and between official and western, where the rates are governed by the official classification the following changes are to be suggested:

Fifth class to be revised from 35 per cent to 37½ per cent of first class.

Sixth class to be revised from 27½ per cent to 30 per cent of first class.

The proposal on coal will follow in general the rates now in effect.

The railroads will ask that the proposed readjustments be made effective by January 1, 1937, to avoid the serious losses of much needed revenue which otherwise

### CLASS I RAILROADS—UNITED STATES

Month of August

	1936	1935	1930
Total operating revenues .....	\$350,584,820	\$293,989,543	\$466,442,467
Total operating expenses .....	246,299,475	221,353,466	327,250,055
Taxes .....	27,963,417	20,504,972	32,185,421
Net railway operating income .....	64,680,717	42,156,706	96,017,672
Operating ratio—per cent .....	70.25	75.29	70.16
Rate of return on property investment .....	2.28	1.48	3.33

Eight months ended August 31

	1936	1935	1930
Total operating revenues .....	\$2,573,257,647	\$2,204,833,031	\$3,615,795,956
Total operating expenses .....	1,916,048,550	1,699,321,769	2,732,817,443
Taxes .....	204,542,689	161,711,951	243,817,706
Net railway operating income .....	364,697,978	263,852,503	556,466,258
Operating ratio—per cent .....	74.46	77.07	75.58
Rate of return on property investment .....	2.30	1.66	3.45

investment. In the first eight months of 1930, net railway operating income was \$556,466,258 or 3.45 per cent. Operating revenues for the first eight months of 1936 totaled \$2,573,257,647, compared with \$2,204,833,031 for the same period in 1935, and \$3,615,795,956 for the same period in 1930, an increase of 16.7 per cent in 1936 over 1935, but 28.8 per cent below 1930. Operating expenses for the eight months amounted to \$1,916,048,550, compared with \$1,699,321,769 for the same period in 1935, and \$2,732,817,443 for the same period in 1930. Operating expenses for the eight months were 12.8 per cent greater than in the same period of 1935, but 29.9 per cent under 1930.

Class I railroads in the first eight months of 1936 paid \$204,542,689 in taxes compared with \$161,711,951 in the same period in 1935, and \$243,817,706 in the same period in 1930. For the month of August alone, the tax bill amounted to \$27,963,417, an increase of \$7,458,445 or 36.4 per cent over August, 1935.

Twenty-two Class I railroads failed to earn expenses and taxes in the first eight months of 1936, of which eight were in the eastern district, three in the southern

or 3.92 per cent. Operating revenues in the eastern district for eight months totaled \$1,306,148,559, an increase of 15.3 per cent, compared with 1935, but 28.1 per cent under 1930. Operating expenses totaled \$932,597,722, an increase of 12.3 per cent above the same period in 1935, but 31.3 per cent below the first eight months of 1930. Class I railroads in the Eastern District for August had a net of \$34,493,095, compared with \$22,542,746 in August, 1935, and \$44,581,813 in 1930.

Class I railroads in the southern district for eight months had a net of \$45,094,522, at the rate of 2.22 per cent. For the same period in 1935, their net amounted to \$29,671,029, at the rate of 1.45 per cent, and for the same period in 1930 was \$54,492,644 or 2.56 per cent. Operating revenues in the southern district for eight months amounted to \$320,461,209, an increase of 15.1 per cent compared with the same period of 1935, and a decrease of 27.5 per cent under 1930. Operating expenses totaled \$243,265,062, an increase of 9.3 per cent above the same period in 1935, but 30.7 per cent under 1930. Class I railroads in the southern

(Continued on page 533)



would result from the expiration of the emergency charges allowed in Ex Parte 115. The revenue received from these charges now represents about one fifth the total net railway operating income. Railroad freight traffic is now moving in greater volume than at any time in the past four years but gross revenues in the first eight months of 1936 were still about 30 per cent below those for the corresponding period in 1930.

The studies do not in all cases include consideration of individual commodity rates which have been made to meet competition with other modes of transportation. The suggestions, therefore, are subject to the general qualification that, except where otherwise provided, commodity rates, not class or column rates, issued to meet truck or water competition and so indicated in tariffs, where not now subject to an emergency charge, need not be increased.

At present it is not contemplated that any change will be made in the rates on grain and grain products, except that in Central Freight Association territory it is proposed to consolidate grain by-products with the grain-products list at grain products rates. No change is contemplated in rates on livestock.

On coal, where the rate per ton is 75 cents or less the proposed increase is 3 cents per gross ton; where the rate is 76 cents to \$1 the increase to be 6 cents; and where the rate is over \$1 the increase to be 11 cents; except that rates within and to the West are to be increased from 3 to 10 cents per net ton and rates over \$1 increased 15 cents per net ton. Rates on coal from Lake Superior and Lake Michigan docks to the interior by rail are to be increased from 3 to 11 cents per gross ton, and rates on lake cargo coal moving to the eastern ports of transshipment are to be increased 10 cents per net ton. Efforts are to be made to effect some arrangement, with the consent of the Interstate Commerce Commission, under which on lake cargo coal having a revenue road haul by rail beyond docks at Lake Michigan and Lake Superior ports, a single increase of 15 cents a ton shall be applied to the combined revenue of the rail lines both to the eastern ports and from the western ports. Rates on tidewater coal moving to the eastern ports of transshipment are to be increased 11 cents per gross ton. Efforts are to be made to effect some arrangement, with the consent of the commission, under which tidewater coal moved by rail from docks at the New England ports to destinations in Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island and Vermont will be subjected to a single increase of 11 cents per gross ton.

For iron and steel articles the proposed increase is 10 per cent with a maximum of 1 cent per 100 lb.

It is estimated that the proposed increases would produce about \$50,000,000 of increased revenue per year, whereas the emergency charges have amounted to about \$100,000,000 yearly.

### Railroad Employment in September

Class I railroads reported to the Interstate Commerce Commission a total of

1,101,668 employees as of the middle of the month of September, an increase of 9.23 per cent as compared with the number in September, 1935, and an increase of 1.07 per cent as compared with the number in August, 1936. The number in the maintenance of way and structures group showed an increase of 11.79 per cent over last year, and the number in the maintenance of equipment and stores group showed an increase of 12.33 per cent.

### Traffic Club of Pittsburgh

The Traffic Club of Pittsburgh will hold its annual dinner on Friday, January 22, 1937, advancing it from the evening of the first Thursday in March, on which date the dinners have been held heretofore.

### Senate Committee Proposes Hearings in Railroad Finance Investigation

Chairman Wheeler of the Senate committee on interstate commerce, after a call at the White House on October 6, told newspaper men that public hearings in connection with the investigation the committee is making into the matter of railroad financial transactions will be started in November or December.

### N. C. & St. L. Appeals Decision

The Nashville, Chattanooga & St. Louis has appealed a federal district court decision upholding a finding by the national railway mediation board that the railway employees' department of the American Federation of Labor is the legal representative for collective bargaining with the railroad under the railway labor act.

### Traffic Clubs to Meet at Dayton

The fifteenth annual meeting of the Associated Traffic Clubs of America will be held at Dayton, Ohio, on October 13 and 14. Speakers at the meeting will include Cornelius Lynde, Interstate Commerce Counsellor at Chicago, and John L. Rogers, director of the Bureau of Motor Carriers of the Interstate Commerce Commission, while the dinner speaker will be Dr. William Mather Lewis, president of Lafayette College, Easton, Pa.

### I. C. C. Orders Hearing on Hours of Bus Employees

The Interstate Commerce Commission has assigned for hearing at Washington on November 19 before Division 5 that part of the proceeding of investigation recently ordered as to the hours of service of motor carrier employees which pertains to employees of motor carriers of passengers, including those engaged in special or charter operations those engaged in operations over either regular or irregular routes, and those engaged in seasonal operations.

### International Acetylene Association

The International Acetylene Association will hold its 37th annual convention at the Hotel Jefferson, St. Louis, Mo., November 18-20. The first day of this three-day meeting will be devoted to the opening luncheon, the general industries sessions and an oxy-acetylene welding and

cutting forum. On the second day will be the heavy industries session and a round-table discussion on welding and cutting, while the third will be devoted to the annual luncheon and business meeting and the piping industries session.

### National Motor Truck Show in Newark, November 3-7

The third annual national motor truck show will be held in Newark, N. J., opening on November 3, and continuing through November 7. Governor Hoffman of New Jersey has designated the week of the show as motor truck transportation week, and will issue a proclamation to that effect. A three-day transportation engineering meeting will be held in conjunction with the show.

Space has already been reserved by more than 75 motor truck and accessories manufacturers in the Newark Centre Market building, where the equipment exposition will be held. More than twice the space has been taken than was utilized for last year's show.

### New York Railroad Club

The next regular meeting of the New York Railroad Club to be held on Friday, October 16, at 7:45 P. M. in the Engineering Societies building, 29 West 39th street, New York City, will be the first meeting since the summer vacation. At this meeting the subject will be: The Besler High Pressure Steam System. The speakers will include K. Cartwright, mechanical engineer, New York, New Haven & Hartford, who will talk on the conversion of two standard steel passenger coaches into a modern streamlined, air-conditioned, steam propelled train. George D. Besler and William J. Besler will describe the design of the high pressure steam system applied to the two-car New Haven passenger train. There will also be stereopticon and motion pictures at this meeting.

### New York State Barge Canal Called Most Unjust Form of Competition

The Associated Railroads of New York State has recently distributed among employees of affiliated railroads a pamphlet setting forth "some of the facts" regarding the New York State Barge Canal System. This pamphlet contends that "of all the competition which the railroads of the Empire State must face, none is more unjust than that presented by the subsidized" barge canal.

The financial history of the canal is sketched with emphasis placed on the statement that "the total cost of the New York State Barge Canal from 1903 to date, including capital investment, interest maintenance and operation has exceeded \$300,000,000, and yet at no time during that period have the people had an opportunity to vote on whether or not the prohibition against tolls should be removed from the Constitution, and reposed with the Legislature." The minimum annual overhead cost for interest and maintenance, borne by the taxpayers, is set up at \$10,646,970—a situation wherein "justice becomes a mockery when all the people of New York State must contribute

\$10,000,000 in taxes every year in order that the few users of the Barge Canal may be enriched in the sum of \$10,000,000 or more annually."

Attention is next called to the fact that up to date any attempt to let the people decide the question of tolls has been defeated and railroad employees are thus urged to support such constitutional-amendment resolutions as they come before subsequent legislatures.

### Save-a-Day Service Established by I. C.

Save-a-day service, designed to afford first morning delivery at Memphis, Tenn., second morning delivery at New Orleans, La., and third morning delivery at Texas points, or one day faster than under previous schedules, was established by the Illinois Central on October 1. On the inaugural run a total of 29 carloads of merchandise were carried. The train leaves Chicago at 7:45 p. m., and arrives at Memphis, Tenn., at 8:35 a. m. the next morning, and New Orleans at 4 a. m. the second morning.

In order to provide for 7:45 p. m. departure time from Chicago, waybills are transferred by telegraph. Bills are completed after the train leaves Chicago and are placed on teletype machines which transmit them to Memphis so that they are available and the train worked immediately upon arrival.

### Winterrowd to Address the Chicago Section, A. S. M. E.

The Transportation division of the Chicago section of the American Society of Mechanical Engineers will hold its first Fall meeting at 7:30 p. m., Thursday evening, October 15, at the Hotel Sherman, Chicago. The subject "Fighting Snow and Ice on the Railways" will be presented in an informal talk by W. H. Winterrowd, vice-president, Franklin Railway Supply Company. Lantern slides will be shown to indicate the various designs and methods of operating snow-fighting equipment from the largest rotary snow plows down to the smallest flange plows. Some of the slides will also show methods of cleaning large terminal yards of snow and ice. Mr. Winterrowd's talk will be based on personal experiences with snow-fighting equipment under the severe winter condition encountered on Canadian railroads.

### Extension of Credit by Motor Carriers

Only shipper witnesses appeared at the hearing in connection with the Interstate Commerce Commission's investigation to determine rules and regulations to govern the extension of credit by motor carriers, which was held in New York on October 5. The session at which Examiner Coyle presided lasted less than an hour. The principal statements of shipper representatives were to the effect that bills rendered by motor carriers now require much checking and thus it was felt that the 15-day credit period allowed under the commission's order of July 8 should be continued temporarily for common carriers at least. Some suggested a 30-day credit period for contract carriers but other witnesses expressed their willingness to have applied to motor carriers the 96-hour

credit limit now applied to railroads after time had been allowed for conditions in the motor carrier field to adjust themselves to such a routine.

### Increased Car Loading Expected for Fourth Quarter

Freight car loading during the fourth quarter of 1936 are expected to be about 9.7 per cent above actual loadings in the same quarter in 1935, according to estimates just compiled by the Thirteen Shippers' Regional Advisory Boards. On the basis of these estimates, freight car loadings of the 29 principal commodities will be 5,603,186 cars in the fourth quarter of 1936, compared with 5,107,030 actual loadings for the same commodities in the corresponding period in 1935. Each of the Thirteen Shippers' Regional Advisory Boards estimates an increase in the loadings for the fourth quarter of 1936 compared with the same period in 1935.

The tabulation below shows the total loading for each district for the fourth quarter of 1935, the estimated loadings for the fourth quarter of 1936, and the percentage of increase.

Shippers' advisory boards	Actual loadings 1935	Estimated loadings 1936	Per cent increase
Allegheny .....	702,118	797,338	13.6
Pacific Coast .....	202,739	209,992	3.6
Pacific Northwest .....	184,018	208,363	13.2
Southeast .....	479,990	541,521	12.8
Southwest .....	329,393	357,045	8.4
Great Lakes .....	354,382	428,361	20.9
Atlantic States .....	533,072	597,663	12.1
Central Western .....	241,634	242,530	0.4
New England .....	108,260	113,966	5.3
Northwest .....	298,034	300,840	0.9
Mid-West .....	715,713	763,257	6.6
Ohio Valley .....	666,961	735,569	10.3
Trans-Missouri-Kansas .....	290,716	306,741	5.5
Total .....	5,107,030	5,603,186	9.7

### An "Autumn-Leaf Excursion" from New York

The Pennsylvania announces another low-rate Sunday excursion; one to see the autumn scenery in the less familiar regions of New Jersey, the train starting from Pennsylvania station, New York, at 8:05 a. m., on October 11. Stopping at Newark, Elizabeth and Rahway, the train will travel by way of Perth Amboy to South Amboy, which was the original northern terminus of the Camden & Amboy, opened in December 1832, the first railroad line between New York and Philadelphia. At Jamesburg, N. J., the excursionists may see 300 ft. of the original track of the Camden & Amboy, still lying there on its stone foundations. From Bordentown, N. J., which originally was the southern terminus of the rails, the train will turn north to Trenton and thence along the east bank of the Delaware river, past Washington's crossing, where there will be a stop of a half hour. Thence to Phillipsburg, N. J., Martin's Creek, Pa., and through Delaware Water Gap to Stroudsburg, Pa. Here the train will stay 45 minutes, whence it will return to New York by way of Trenton.

### Railway Fire Protection Association

The Railway Fire Protection Association (W. F. Hickey, president, New Haven, Conn.) will hold its annual meeting at the Congress Hotel, Chicago, on October 20 and 21. The tentative program

calls for the usual statistical reports on Tuesday morning, October 20, followed by committee report on gasoline and gas pipelines, by W. F. Steffens, chairman. Other subjects to be reported on by committee, with the name of the chairman in each case, are: Tuesday afternoon: shop plants, J. R. Peters; freight car heaters and refrigerator cars, P. A. Bissell; incinerators, P. A. Bissell; timber treating plants, E. M. Strauss.

Wednesday forenoon: Hand book committee, T. E. Chapman, Jr.; snow melting oil and handling of gasoline, J. E. Fraser; gasoline and electric trucks and Diesel engines, W. F. Steffens; merchandise in transit, W. S. Topping; locomotive fire hazards, W. A. Radspinner; stations and freight houses, T. E. Chapman, Jr.; cotton hazards, E. Williamson; fuel oil, W. A. Radspinner; storage of records, J. L. Rice.

Wednesday afternoon: Fire prevention week, with reports from all members; air conditioning, with discussion; affiliating with A. A. R. or N. F. P. A. Following these discussions there will be nine reports from special committees whose work is carried on jointly with other organizations: namely, A. A. R. motor transport; national fire waste council; N. F. P. A. dust explosions; N. F. P. A. field practice; N. F. P. A. gases; N. F. P. A. protection of openings in walls; N. F. P. A. arson law campaign; A. R. E. A.; N. F. P. A. fire proofing.

### C. G. W. Employees Begin Strike Vote

A strike ballot among employees in engine and yard service of the Chicago Great Western was begun on October 3 to force the payment of awards made to employees by the National Railroad Adjustment Board for alleged violations of various contract rules. Earlier in the day trustees of the railroad filed a petition in the federal district court at Chicago assailing the labor board's ruling and asking the court to disapprove or approve the payment, which amounts to approximately \$60,000. The compensation demanded arises from a rule which provides that where three continuous eight hour shifts are worked in continuous service, the first shift shall begin work between 6:30 a. m. and 8 a. m., the second between 2:30 p. m. and 4 p. m. and the third between 10:30 and 12 midnight. In the Kansas City terminal the railroad had started one shift at 1 p. m., which ended at 9 p. m., and another at 11:59 p. m., ending at 7:59 a. m., paying full eight hour wages for the shifts. Union rules require that when an employee is called for work he must be paid for eight hours, whether or not the full time is worked. The rules also provide that where two shifts are worked within the same 24 hours, time and a half must be paid for all over eight hours.

In the present case the unions contend that starting the afternoon shift at 1 p. m., instead of 2:30 p. m., technically required that employees work two shifts, despite the fact that the full time did not exceed eight hours. They demand eight hours' pay for the time from 2:30 p. m. to 9 p. m. and, since the first hour and a half, from 1 p. m. to 2:30 p. m., falls



within a second shift, employees should be compensated for a full eight-hour shift at time and a half, or 12 hours, making a grand total of 20 hours.

### Literary Digest Poll on Railroads

That reduced fares will influence people to travel more by railroad and that most shippers route by rail is indicated by a poll conducted by The Literary Digest among 1,000 readers, selected at random from subscription lists, and 1,000 subscribers who could be identified as manufacturers. The results are as follows (323 replies or 32.3 per cent):

Question 1—Do you know that rail passenger rates have been reduced? 98.7 per cent answered yes.

Question 2—Will the reduction in rail passenger rates influence you to travel more by train? 76.4 per cent answered yes.

Question 3—Does the business in which you are engaged route its shipments of freight by rail? 61.9 answered yes.

9.6 per cent ship 25 per cent of their freight by railroad

4.6 per cent ship 35 per cent of their freight by railroad

11.1 per cent ship 50 per cent of their freight by railroad

19.5 per cent ship 75 per cent of their freight by railroad

14.4 per cent ship 100 per cent of their freight by railroad

1.8 per cent ship miscellaneous volume by railroad

42.1 per cent ship 50 per cent or more of their freight by railroad

31.8 per cent of the replies are from officials

18.5 per cent of the replies are from managers

12.6 per cent of the replies are from clerks

27.5 per cent of the replies are from manufacturers

10.0 per cent of the replies are from wholesalers

20.7 per cent of the replies are from retailers.

All of the percentage figures on each of the polls are based on the total number of replies from each of the polls.

Some of the percentage figures, when added together, do not total 100 per cent. This is due to the fact that there were no replies from certain ones, and, in the case of occupations (especially in the general list) there were a great many lawyers, judges, physicians, etc.

### I.C.C. Asked to Investigate Southern Class Rates

The Joint Conference of Southern State Commissioners and Shippers, organized at a meeting at Atlanta, Ga., on September 3, with Jud P. Wilhoit as chairman, has filed with the Interstate Commerce Commission a petition asking for an investigation of the class rate structure now in effect in southern territory to the end that it may be revised downward "to remove the undue burden now resting on southern shippers of freight." Similar petitions were filed at the same time by seven state railroad or public service commissions and the Association of Southeastern Railroad

and Public Service Commissioners and by the Southern Traffic League; also by a dozen or more chambers of commerce, traffic bureaus, etc.

The petition declared that the South suffers no natural handicap except remoteness from the principal markets and "that this remoteness is exaggerated "by the maintenance of excessive and unreasonable class rates which bear no relation whatsoever to what are just and reasonable rates." It is asserted that these rates are largely due to the results of divergent traffic policies of the railroads and in part to the fact that the commission has permitted these traffic policies to be reflected in its decisions. The present class rates in the South, it is pointed out, resulted from the decision of the commission in the investigation started by the commission in 1920 which has since been used to a considerable extent as a basis for commodity rates by relating commodity rates by percentages to the first class rates.

The petition says that thousands of examples may be cited to indicate that the existing high levels of rates have actually retarded the movement of traffic and that the carriers have "tardily, in most instances," reduced rates on much of the traffic until to-day the class rate level is something of a fiction. "The present antique and obsolete structure," the petition declares, "should be replaced by something modern that will combine improved service with reduced cost."

### C. P. R. Adopts Contributory Pension Plan

The Canadian Pacific's non-contributory pension system will be replaced as from January 1, 1937, by a new plan calling for contributions from eligible employees. The new system was made necessary, the President, Sir Edward Beatty, states by "changes in conditions" which have made it clear that "continuance of the present system would eventually impose upon the company financial burdens which it would be unable to bear."

The present system, financed entirely by the company, has been in effect since January 1, 1903. Consideration of a change has been under way for some time, the management seeking a system which would "give reasonable assurance that, in the absence of circumstances beyond its control, the payment of pensions upon the present scale may be continued."

A joint committee of company and employees' representatives worked out details of the new plan. Generally, it will adhere as closely as possible to the underlying principles of the present system, the announcement states, with other changes as are necessary "to meet altered conditions."

"It is hoped all those eligible will become contributors." Sir Edward declares. Employees, under the plan, would contribute 3 per cent of their earnings. While the fund is being built up, the company will continue to pay the larger part of pensions allowances. Since the non-contributory plan's inception in 1903, the railway has paid out \$18,201,640 in pensions. Under the new plan rates of pension will be practically unchanged, and the pen-

sioning age will be the same as it now is.

The plan embraces all branches of the company's services as well as subsidiary companies controlled and operated by the C.P.R. It will be administered by seven men, four of them company officers and the remaining three representing the organized employees.

### Incoming and Retiring C. N. R. Heads Praise Its Employees

A tribute to the loyalty and spirit of service of the employees of the Canadian National was paid by President S. J. Hungerford in a message to the staff throughout the system in assuming also on October 1 the office of chairman of the board. Mr. Hungerford expressed the belief that through the joint efforts of the management and staff the system could be made of increasing value to the nation. After his tribute, he added:

"Service in any capacity with the Canadian National Railways should bring to those who accept it a deep sense of responsibility. The activities of the system, by reason of its size and its history, produce problems every day that call for concentrated and co-ordinated effort. The responsibility attaching to those tasks is deepened by the important factor that the well-being of the country and that of the Canadian National Railways are so closely related as to be inseparable. If this circumstance increases in some way the burden, it makes greater the opportunity to render important public service."

The retiring chairman, C. P. Fullerton, also addressed a message to the staff, stating that "it will ever be a source of gratification to me to recall the invariable loyalty and co-operation accorded the trustees and the faithful way duties were performed, often under difficult and trying conditions. These factors contributed in no small measure to the results attained during the administration of the trustees. As Chairman I have been closely in touch with all phases of the system's activities, and I have been impressed with the fine spirit and competency of all in the service."

The new board of directors, on October 1 supplanted the trustees, who formerly managed the property.

### Number of Grade Crossings Reduced

Fewer highway-railroad grade crossings were in existence on January 1, this year, than on any similar date in the past ten years, the Association of American Railroads announced. On January 1, 1936 there were 234,231 highway-railroad grade crossings, a reduction of 8,578 compared with the number that existed on January 1, 1930, when there were 242,809, the greatest number on record. Since 1930 there has been a gradual reduction each year in the number of highway grade crossings.

Part of this reduction in recent years can be attributed to the program adopted by the government calling for the use of federal funds for the elimination of highway-railroad grade crossings as a means of promoting unemployment relief. Since 1933, 2,668 highway-railway grade crossings either have been or will be eliminated in the near future. The Bureau of Public

Roads of the Department of Agriculture estimates that by the time the present program has been completed, more than 3000 grade crossings will have been eliminated. Part of this work has been brought about by funds provided in the public works act of 1933 and the Hayden-Cartwright act while under the emergency relief appropriation act of 1935 \$200,000,000 was set aside to be used for the elimination of hazards to life at grade crossings. From funds provided in the public works and the Hayden-Cartwright acts, 714 grade crossings separation projects have been undertaken, while from the \$200,000,000 appropriated in the emergency relief appropriation act of 1935, 1,699 highway-railroad grade crossing projects either have been completed, are now under construction, or are to be constructed under plans already approved by the Bureau of Public Roads. In addition, federal funds are also being used for the installation of flashing lights and other protective devices at 868 additional grade crossings.

### P. & S. Division Selects Committees

The Purchases and Stores Division, A. A. R., has announced the selection of subjects for study this year and a tentative list of the committee membership. Two new subjects, "Maintenance of Way and Construction Materials" and "Extension of Purchasing in Standard Packages," have been assigned to committees, the latter comprising 28 members organized in four territorial groups to assure a comprehensive analysis. New chairmen have been appointed for all standing committees with the exception of the Committee on Simplification and Standardization, and the Committee on Commissary Supplies has been replaced by a committee appointed by J. M. Symes, vice-president, A. A. R., to include representation of the dining car and accounting departments. The appointments to the new and reorganized subject committees are as follows:

**Maintenance of Way and Construction Materials:** Frank McGrath, traveling storekeeper, B. & M., chairman; C. A. G. Blomquist, stores accountant, C. of G.; C. M. Burpee, research engineer, purchasing department, D. & H.; K. P. Chinn, assistant general storekeeper, T. & N. O.; W. B. Hall, purchasing agent, D. & R. G. W.; J. L. Quarles, district storekeeper, C. & O.; W. P. Stewart, supervisor of scrap, I. C.; A. L. Sorensen, manager of stores, Erie, chairman ex-officio.

**Extension of Purchasing in Standard Packages:** W. A. Clem, purchasing agent, Reading, general chairman; A. G. Follette, general material supervisor, Penna., assistant general chairman. *Subcommittee A:* E. H. Hughes, general storekeeper, K. C. S., chairman; A. W. Blume, general storekeeper, St. L.-S. F.; H. Crouse, general storekeeper, T. & P.; W. F. Niehaus, assistant to purchasing agent, M-K-T.; L. L. Studer, district storekeeper, M. P.; C. L. Wakeman, general storekeeper, Wabash *Subcommittee B:* L. F. Duvall, assistant general storekeeper, A. C. L., chairman; John Carmichael, superintendent of stores, W. Md.; U. S. Cornelius, traveling storekeeper, Southern; Herbert M. Hobson, stockkeeper, L. & N. *Subcommittee C:* W. A. Clem, purchasing

agent, Reading, chairman; W. C. Ather-ton, purchasing agent, P. M.; James Deery, assistant purchasing agent, Penna.; F. I. Foley, general storekeeper, N. Y., N. H. & H.; J. H. Geary, material inspector, Erie; J. S. Genthner, general storekeeper, L. & N. E.; C. C. Hubbell, general purchasing agent, D. L. & W.; F. J. McGuinness, superintendent of stores, D. & H.; A. P. Pollard, traveling storekeeper, B. & M. *Subcommittee D:* L. L. King, assistant purchasing agent, I. C.; G. A. Goerner, general storekeeper, C. B. & Q.; W. C. Hunt, general traveling storekeeper, A. T. & S. F.; L. Kilmer, general storekeeper, G. T. W.; A. M. Lemay, inspector of stores, C. M. St. P. & P.; F. J. McMahon, general storekeeper, N. Y. C.; J. E. McMahon, assistant purchasing agent and general storekeeper, C. St. P. M. & O.; R. M. Nelson, purchasing agent, C. & O.

**Supplies for Dining Cars, Hotels and Commissaries:** W. J. Farrell, secretary, Purchases and Stores Division, A. A. R., chairman; A. F. Free, disbursements assistant, Accounting Division, A. A. R.; P. L. Grammer, assistant purchasing agent, Penna.; L. M. Jones, superintendent dining cars, C. M. St. P. & P.; L. P. Krampf, supply agent, M. P.

**Material Classification:** W. R. Culver, general storekeeper, C. St. P. M. & O.; Bouque, assistant to general storekeeper, S. P.; D. H. Reed, traveling storekeeper, Southern; W. S. Riach, chief clerk to general storekeeper, A. T. & S. F.; E. G. Roberts, chief clerk to general storekeeper, C. R. I. & P.; C. H. Murrin, general storekeeper, L. & N., chairman ex-officio.

**Railroad Scrap:** W. J. Sidey, supervisor scrap and reclamation, L. V., chairman; G. W. Alexander, general storekeeper, C. of G.; E. J. Becker, district storekeeper, S. P.; V. N. Dawson, district storekeeper, B. & O.; R. E. Hamilton supervisor reclamation, C. & O.; C. L. McIlvaine, assistant purchasing agent, Penna.; C. A. Malone, purchasing department, A. T. & S. F.; C. E. Reasoner, scrap supervisor, M-K-T.; J. C. Kirk, assistant general storekeeper, C. R. I. & P.; chairman ex-officio.

**Joint Committee on Reclamation—P. & S. Div. Representatives:** J. J. Collins, supervisor scrap and reclamation, Erie, chairman; I. C. Bon, superintendent reclamation, Wabash; E. R. Casey, superintendent reclamation, U. P.; T. J. Hegeman, superintendent scrap and reclamation, C. B. & Q.; E. W. Peterson, general storekeeper, Bang. & Aroos; A. L. Prentice, manager, scrap and reclamation, N. Y. C.; J. C. Kirk, assistant general storekeeper, C. R. I. & P., chairman ex-officio.

**Stock Reports and Store Expenses:** M. E. Baile, assistant supply agent, M. P., chairman; O. L. Browne, assistant to purchasing agent, A. C. L.; S. A. Hayden, general storekeeper, M-K-T.; E. H. Landers, general storekeeper, N. Y. C.; J. F. Riddle, statistician, stores department, Penna.; W. L. Wheeler, assistant general storekeeper, C. & N. W.; O. A. Donagan, general storekeeper, B. & M., chairman ex-officio.

**Forest Products:** A. J. Neault, assistant general purchasing agent, C. & N. W., chairman; H. O. Bush, general lumber and tie inspector, Erie; D. R. El-

more, assistant to general manager, Fruit Growers' Express; W. S. King, tie and timber agent, C. & O.; L. W. Kistler, superintendent treating plants, St. L.-S. F.; E. H. Polk, assistant purchasing agent, S. P.; G. H. Robison, purchasing agent, U. P.; H. E. Warren, manager, purchases and stores, G. M. & N.; James Young, assistant purchasing agent, Penna.; C. C. Warne, purchasing agent, N. Y. C., chairman ex-officio.

**Highway Motor Vehicles:** C. E. Smith, vice-president, N. Y., N. H. & H., chairman; R. C. Harris, general storekeeper, Penna.; J. H. Lauderdale, general purchasing agent, M. P.; E. S. Jamieson, assistant general purchasing agent, U. P., chairman ex-officio.

**Fuel:** P. A. Hollar, fuel purchasing agent, Penna., chairman; Robert Collett, fuel agent, St. L.-S. F.; W. J. Hiner, fuel purchasing agent, N. Y. C.; A. E. Johnson, fuel agent, C. M. St. P. & P.; G. W. Leigh, purchasing agent, M. St. P. & S. S. M.; M. H. McGlynn, fuel agent, C. R. I. & P.; J. E. Mays, fuel agent, B. & O.; F. D. Rosebrook, fuel agent, C. & N. W.; G. E. Scott, purchasing agent, M-K-T., chairman ex-officio.

**Forecasting Requirements:** G. O. Beale, chief purchasing and stores officer, C. & O., chairman; C. D. Baldwin, purchasing agent, Bang. & Aroos; Clyde Cocke, purchasing agent, N. & W.; T. A. Hodges, general storekeeper, S. A. L.; A. B. Lackey, division storekeeper, Southern; K. A. McDonald, chief clerk to purchasing agent; C. K. Reasor, assistant manager stores, Erie; W. F. Redman, traveling storekeeper, C. & N. W.; E. D. Toye, general storekeeper, C. N. R., chairman ex-officio.

**Pricing and Inventory:** C. B. Hall, stores manager, Penna., chairman; B. T. Adams, district storekeeper, I. C.; L. J. Ahlering, purchasing and stores agent, C. & E. I.; H. B. Akin, district storekeeper, C. N. R.; G. J. Hunter, traveling material supervisor, A. T. & S. F.; C. A. Nichols, assistant general storekeeper, N. P.; G. W. Scott, district storekeeper, M-K-T.; J. W. Watkins assistant to general storekeeper, L. V.; L. P. Krampf, supply agent, M. P., chairman ex-officio.

**Purchasing Organization and Records:** J. F. McAlpine, assistant purchasing agent, C. B. & Q., chairman; F. E. Driscoll, purchasing agent, Erie; J. W. Hagerty, general supervisor purchasing department, Penna.; C. B. Hanover, chief clerk to purchasing agent, C. M. St. P. & P.; J. H. James, purchasing agent, P. & L. E.; C. R. Painter, purchasing agent, N. Y., N. H. & H.; A. A. Taylor, assistant general purchasing agent, M. P.; M. L. Tynan, general purchasing agent, Railway Express Agency; G. T. Wickstrom, assistant to general purchasing agent, U. P.; E. M. Willis, purchasing agent, N. P.; E. J. Lammeck, purchasing agent, Penna., chairman ex-officio.

**Stationery and Printing:** B. B. Melgaard, assistant to purchasing agent, C. M. St. P. & P., chairman; H. C. Boldebuck, stationery buyer, C. B. & Q.; J. L. Gorsuch, stationer, W. Md.; W. W. Griswold, stationer, C. R. I. & P.; B. Kocher, stationery storekeeper, C. N. R.; O. B. Mills, stationery storekeeper, Penna.; G. E. Per-



rot, stationery supervisor, S. A. L.; J. T. Van Horn, stationer, M. P.; E. G. Walker, assistant general purchasing agent, A. T. & S. F., chairman ex-officio.

**Fire Prevention:** W. F. Sanford, district storekeeper, C. & N. W., chairman.

**Material Handling:** W. S. Morehead, general storekeeper, I. C., chairman; D. Corcoran, general storekeeper, C. & N. W.; J. U. King, general storekeeper, A. C. L.; A. S. McKelligon, general storekeeper, S. P.; H. E. Ray, general storekeeper, A. T. & S. F.; H. M. Smith, general storekeeper, N. P.; J. W. Wade, general storekeeper, N. & W.; E. W. Walther, general storekeeper, B. & O.; L. B. Wood, general storekeeper, S. P., chairman ex-officio.

**Simplification and Standardization:** A. G. Follette, general material supervisor, Penna, chairman; J. E. Conroy, district storekeeper, C. & N. W.; W. J. Dixon, supervisor material standards, M. P.; E. A. Ernst, traveling storekeeper, C. R. I. & P.; W. M. Hinkey, district storekeeper, B. & O.; J. L. Irish, assistant general storekeeper, U. P.; C. J. Irwin, purchasing agent and storekeeper, G. C. & S. F.; J. K. McCann, inspector of stores, C. B. & Q.; W. H. Morris, general storekeeper, Reading; G. P. Turner, division storekeeper, Reading; G. P. Turner, division storekeeper, Southern; C. B. Tobey, general storekeeper, L. V., chairman ex-officio.

**Exchange of Surplus Material:** F. D. Reed, purchasing agent, C. R. I. & P., chairman; F. S. Austin, assistant purchasing agent, N. Y. C.; W. J. Diehl, purchasing agent, M. & O.; U. K. Hall, general purchasing agent, U. P.; C. H. Kenzel, purchasing agent, E. J. & E.; R. D. Long, purchasing agent, C. B. & Q.; H. P. McQuilkin, assistant purchasing agent, B. & O.; A. W. Munster, vice-president, B. & M.; C. E. Walsh, general purchasing agent, Penna.; A. C. Mann, vice-president, I. C., chairman ex-officio.

**Joint Committee on Inspection—P. and S. Div. Representatives:** A. C. Mann, vice-president, I. C., chairman; E. A. Clifford, general purchasing agent, C. & N. W.; F. D. Reed, purchasing agent, C. R. I. & P.; G. H. Walder, purchasing agent, C. M. St. P. & P.; C. E. Walsh, general purchasing agent, Penna.

**Material Guarantees:** J. T. Kelly, general storekeeper, C. M. St. P. & P., chairman; J. L. Brown, purchasing agent, S. A. L.; E. A. Jones, purchasing agent, L. V.; I. H. Lance, general storekeeper, D. L. & W.; H. M. Rainie, purchasing agent, B. & M.; A. C. Simmons, purchasing agent, C. G. W.; M. E. Towner, general purchasing agent, W. Md.; J. L. Bennett, purchasing agent, C. of G., chairman ex-officio.

**Stock Book Records Versus Stock Card Records:** L. C. Thomson, manager of stores, C. N. R.; H. E. Ray, general storekeeper, A. T. & S. F.

## Eight Months Railway Net

(Continued from page 528)

district for August had a net of \$6,609,394, compared with \$3,242,837 in August, 1935, and \$5,848,822 in August, 1930.

Class I railroads in the western district for eight months had a net of \$91,006,591,

at the rate of 1.52 per cent. For the same eight months in 1935, the railroads in that district had a net of \$51,846,646, at the rate of 0.86 per cent, and for the same period in 1930 it was \$197,454,863 or 3.17 per cent. Operating revenues in the western district for eight months' amounted to \$946,647,879, an increase of 19.3 per cent over the same period in 1935, and a decrease of 30.2 per cent under 1930. Operating expenses totaled \$740,185,766, an increase of 14.5 per cent compared with the same period in 1935, but 27.7 per cent below 1930. For August alone the Class I railroads in the western district reported a net of \$23,578,228, compared with \$16,371,123 for the same roads in August, 1935, and \$45,587,037 in August, 1930.

The Interstate Commerce Commission's Bureau of Statistics has also issued its advance summary of railroad revenues and expenses for August, showing an increase in freight revenue as compared with August, 1935, of 20.3 per cent, and an increase in passenger revenue of 16.2 per cent. In the eastern district freight revenue increased 22.4 per cent and passenger revenue 14.3 per cent. In the Pocahontas region freight revenue increased 23.2 per cent and passenger revenue 28.6 per cent. In the southern region freight revenue increased 21.1 per cent and passenger revenue 19.7 per cent. In the western district freight revenue increased 17.7 per cent and passenger revenue 17.7 per cent.

## Construction

### BALTIMORE & OHIO CHICAGO TERMINAL.

—A contract has been awarded to the Ellington-Miller Company, Chicago, for the construction of a railroad-motor truck freight terminal on the east bank of the Chicago river at Fourteenth street, Chicago, at a total cost of about \$300,000. The terminal building, which will be leased to the Keeshin Motor Express Company, will be 190 ft. by 500 ft. in dimensions and will be of brick and steel construction on concrete foundations. Principally of one-story construction, the structure will embody a three-story office building, 60 ft. by 190 ft., at one end.

### BALTIMORE & OHIO-PENNSYLVANIA.

The elimination of the Chili avenue crossings of these roads in Rochester, N. Y., has been directed by the New York Public Service Commission. The crossings are to be eliminated by raising the grades of the railroads. The estimated cost of construction is \$300,500 and the cost of land is estimated at \$91,100. Of the 50 per cent share of the cost to be paid by the railroads, the commission ordered the B. & O. to pay 60.5 per cent and the Pennsylvania 39.5 per cent. The B. & O. is to prepare the plans and perform the work.

**CANADIAN NATIONAL.**—This road has received tenders for construction work on a new branch line through the northern Quebec mining area. The new branch will extend from Senneterre, 72 miles west of Taschereau on the National Transcontinental to Rouyn. The bids were for

clearing the right of way, grading the roadbed, installing culverts for drainage, erection of trestles to carry the tracks over the larger drainage openings, and the construction of the sub-structures for the main bridges. There will be two important bridges. The track-laying work and ballasting will be done by the Canadian National with its own track forces.

**CHESAPEAKE & OHIO.**—This company is developing plans to extend six stalls of its roundhouse at Ashland, Ky., at a cost of about \$48,000; it has also received bids on some of the work of raising the grade of track and riprapping embankment of roadbed, and anchoring track on selected portions of its James River line, between Richmond, Va., and Clifton Forge, to cost about \$300,000.

**MINNEAPOLIS & ST. LOUIS.**—A contract has been awarded to the Ross & White Company, Chicago, for the construction of an automatic electric two-track locomotive coaling station at Olds, Iowa.

**MISSOURI PACIFIC.**—This company is contemplating the strengthening of the existing piers in its bridge across the Kaskaskia river at Roots, Ill., at a cost of about \$30,000. The work is to be carried out by company forces.

**NEW YORK CENTRAL.**—A low bid submitted by the Duffy Construction Corporation, New York, of \$36,426 covering the construction of maintenance of way building in the Peat street yards in connection with the elimination of the grade crossings of this road in Syracuse, N. Y., has been approved by the New York Public Service Commission, and the commission directed the railroad company to award the necessary contract and begin the work as soon as practicable. See *Railway Age* September 26, page 465.

**NEW YORK CENTRAL.**—A contract has been let to the Cold Spring Construction Company, Akron, N. Y., for the elimination of the grade crossing of the Alden-Crittenden county road just west of Crittenden station, N. Y.; a contract has been given to James Stewart & Company, Inc., New York, for remodeling superstructure of the elevated public highway, city structure No. 2, at West 70th street, New York City, and a contract has been given to Miller-Blyth, Inc., New York, for the construction of an addition to sub-station No. 6-A at Harmon, N. Y.

**STATEN ISLAND RAPID TRANSIT RAILWAY COMPANY.**—This Baltimore & Ohio subsidiary has authorized work on Staten Island, N. Y., including the elimination of the grade crossing at Jersey street, New Brighton. The Faircroft Engineering Corp., Brooklyn, N. Y., submitted a low bid of \$118,761 to carry out this work. Bids will be received until 1 p. m. October 13 for the elimination of grade crossings, furnishing, fabricating and delivering structural steel at Jersey street, New Brighton, and at Chestnut avenue, Rosebank, to cost about \$15,000 and bids will be received until 2 p. m. October 13 for the elimination of the grade crossings at Lynhurst and Chestnut avenues, Rosebank, and at Cedar avenue, Arrochar, to cost about \$190,000.

## Equipment and Supplies

### 1936 Equipment Orders Nearly Double 1935's

Orders reported in September for 29 locomotives, 3,100 freight cars and 30,000 tons of rail

Orders for 29 locomotives—24 for domestic service and 5 for export—and for 3,100 freight cars for domestic service were reported in September issues of *Railway Age*. Thus did last month's purchases bring 1936's totals to date in those two categories to nearly double the volume re-

business in the freight car field, having for the past three months been in excess of that of any year since 1930, is now equal to 80 per cent of that year's total. In addition there have been 1936 export orders for 516 freight cars and there were outstanding at the close of last month inquiries for 2,400 freight cars—1,300 for domestic service and 1,100 for export.

Thus far in 1936 a total of 141 passenger-train cars has been ordered, exclusive of articulated units for streamlined trains. This situation, as stated at the outset, remains the same as it has been for the past two months. During the 12 months of 1935, 63 passenger-train cars were ordered while in only one year since 1930—1934 with its 388—have orders for more passenger-train cars been reported than have been placed during this year's first nine months. On October 1 domestic inquiries

tion requires the return of 250 employees at Baltimore, (Mt. Clare), Md., 150 at Cumberland, 150 at Glenwood, Pa., and 175 at DuBois, a total of 725 employees.

THE NEW YORK CENTRAL SYSTEM is inquiring for 25 locomotives of the 4-6-4 type for service on the New York Central, and for 25 switching locomotives of the 0-8-0 type for service on the Pittsburgh & Lake Erie.

### FREIGHT CARS

THE BETHLEHEM STEEL COMPANY is building in its own shops, 100 hopper cars of 70 tons' capacity.

THE KENNECOTT COPPER CORPORATION is inquiring for 240 light-weight flat-bottom, steel ore cars of 100 tons' capacity.

THE GULF, MOBILE & NORTHERN is inquiring for 100 gondola cars and 150 single sheathed box cars, with an alternate bid on 400 box cars, all to be of 50 tons' capacity.

THE NEW YORK, NEW HAVEN & HARTFORD plans to equip freight cars with cast steel side frames at a cost of \$1,081,000, if permission to spend the money is granted by the Federal Court. This is in addition to the work on 2,500 other cars reported in the *Railway Age* of February 22, page 340.

### PASSENGER CARS

THE CHICAGO, ROCK ISLAND & PACIFIC, subject to the approval of the federal district court and the Interstate Commerce Commission, will purchase six light-weight streamlined trains at a cost of approximately \$2,500,000. See item on page 525 of this issue.

### IRON & STEEL

THE LOUISVILLE & NASHVILLE has ordered 27,000 tons of rails from the Tennessee Coal, Iron & Railroad Company.

NEW YORK CENTRAL.—Bids have been received for 800 tons of steel for grade crossing elimination work at Rochester, N. Y.

LONG ISLAND.—A contract has been let to the American Bridge Company for 240 tons of steel for grade crossing elimination work at Smithtown, N. Y. Tully & Di Napoli, Long Island City, are the general contractors.

THE RAILROAD CREDIT CORPORATION made during the month of September two liquidating distributions of 1 per cent each, both payable on September 30. The two distributions returned to participating carriers a total of \$1,470,828, of which \$759,856 was paid in cash and \$710,972 credited on carriers' indebtedness to the corporation. This brings the total amount distributed since liquidation began to \$47,801,902 or 65 per cent of the emergency revenue originally contributed by the carriers. Of this total, \$23,235,442 has been returned in cash and \$24,566,460 in credits.

### Domestic Equipment Orders Reported in Issues of the Railway Age in September, 1936

LOCOMOTIVES					
Date	Name of Company	No.	Type	Builder	
Sept. 5	Green Bay & Western	3	2-8-2	American Locomotive Co.	
Sept. 12	Aliquippa & Southern	1	0-8-0 switching	American Locomotive Co.	
Sept. 12	Toledo, Peoria & Western	6	4-8-4	American Locomotive Co.	
Sept. 26	Birmingham Southern	5	Diesel-electric	American Locomotive Co.	
Oct. 3	Atchison, Topeka & Santa Fe	1	4-6-4	Baldwin Locomotive Works	
		1	4-8-4		
Oct. 3	Birmingham Southern	5	Diesel-electric	Electro-Motive Corp.	
Oct. 3	Detroit & Toledo Shore Line	2	2-8-2	Lima Locomotive Works	
FREIGHT CARS					
Sept. 5	Maine Central	500	Box	Magor Car Corp.	
		100	Gondola	Bethlehem Steel Co.	
		150	Twin Hopper	Bethlehem Steel Co.	
Sept. 12	Boston & Maine	750	Gondola	Bethlehem Steel Co.	
Sept. 12	Missouri Pacific Lines (New Orleans, Tex. & Mex.)	200	Box	Mt. Vernon Car Manu. Co.	
Sept. 19	Union Railroad Co.	100	Gondola	Ralston Steel Car	
Oct. 3	Chicago & Eastern Illinois	500	Box	Gen. American Trans. Corp.	
Oct. 3	Wabash	400	Hopper	Wabash Car & Equip. Co.	
Oct. 3	Reading Company	200	Gondola	Company Shops	
		200	Auto Box		

ported for the entire 12 months of 1935. And while September was the second successive month in which no domestic orders for passenger-train cars were reported, the 1936 purchases of this class of rolling stock were by the end of July equal to twice 1935's 12-month volume. In the market for rail the September orders for 30,000 tons made this year's tonnage more than 57,000 tons in excess of that placed throughout 1935.

During the first nine months of this year a total of 158 locomotives has been ordered, excluding power units for streamlined trains. This compares with 83 locomotives ordered throughout 1935 and is a better volume than that reported for the entire 12 months of any year since 1930, excepting 1931 and 1934 when 176 and 183 locomotives were ordered respectively. Also, in the 1936 business are orders for 122 steam locomotives or as many of this type as were ordered during the entire four-year period, 1932 to 1935. In addition there were outstanding on October 1 inquiries for 80 steam locomotives—67 for domestic service and 13 for export—and plans had been announced for the purchase of three others for domestic service.

The 3,100 freight cars ordered in September brought this year's total to date to 37,354, a figure which is but 44 cars short of being double the 18,699 freight cars ordered throughout 1935. This year's

for 12 passenger-train cars were outstanding.

The 30,000 tons of rail ordered in September brings this year's total to date to 552,585 tons as compared with the 495,300 tons placed throughout 1935.

### LOCOMOTIVES

PITTSBURGH & LAKE ERIE—See New York Central System.

THE UNION PACIFIC is inquiring for 20 locomotives of the 4-8-4 type.

THE WHEELING & LAKE ERIE is inquiring for 10 locomotives of the 2-8-4 type.

THE UNIVERSAL ATLAS CEMENT COMPANY, Chicago, has ordered one 600 h.p. Diesel-electric switching locomotive from the American Locomotive Company.

THE DETROIT & TOLEDO SHORE LINE ordered three locomotives of the 2-8-2 type from the Lima Locomotive Works. Through a typographical error, this was reported as two locomotives, in the *Railway Age* of October 3.

THE BALTIMORE & OHIO has started work on locomotive repairs in four of its principal shops. The reconditioning and repair of 100 freight locomotives are included in the program. To perform the specialized work of locomotive rehabilita-



## Supply Trade

The National Carbide Sales Corporation, New York, subsidiary of the Air Reduction Company, has changed its name to the **National Carbide Corporation**.

**Leo N. Blago** has been appointed field representative in the southeastern district for the **Copperweld Steel Company**, Glassport, Pa. Mr. Blago's headquarters are in the Hurt building, Atlanta, Ga.

**S. M. Hunter**, formerly sales manager of the Novo Engine Company, is now affiliated with the sales department of the **American Hoist & Derrick Company**, St. Paul, Minn.

The **Gould Coupler Corporation**, Depew, N. Y., has succeeded to and acquired the entire business of **The Gould Coupler Company**. No change is contemplated in policies, management or business operations.

The **Linde Air Products Company**, New York, a unit of the Union Carbide & Carbon Corporation, has opened a new district office at 2 Virginia street, Charleston, W. Va., with **A. R. O'Neal** as district manager.

**Lewis W. Metzger, Jr.**, has been appointed sales representative of **The Baldwin Locomotive Works**, covering the southern railroads, formerly covered by the late William B. Keys. Mr. Metzger attended school in the East and, in 1913, entered the employ of The Baldwin Locomotive Works as a special apprentice. In May, 1917, he left Baldwin to serve as machine shop foreman with the Bethlehem Steel Company, leaving that position in July, 1919, to return to Baldwin. From March, 1920, until his present appointment, he has been engaged in sales work for both the Baldwin Locomotive Works and the Standard Steel Works Company, in Houston, Texas, Richmond, Va., and in the home office at Philadelphia, Pa.

**Arthur S. Goble** has been appointed manager of the Philadelphia district of **The Baldwin Locomotive Works**, relieving **Stewart McNaughton** who will devote his full time to his increasing duties as general sales manager. Mr. Goble graduated from the University of Illinois in 1904 and immediately entered the employ of the Chicago & North Western as assistant to the chemist and engineer of tests. In 1911, he left the railroad to enter into sales work for The Baldwin Locomotive Works, first in New York and later in Chicago. Between the years 1918 and 1932, Mr. Goble was district manager of the Baldwin office in St. Louis, Mo. For the next two years, he was vice-president of the Hanna Stoker Company, returning to Baldwin on June 1, 1934. From that date until his recent appointment, he has been engaged in sales work with headquarters in the home office at Philadelphia, Pa.

**H. D. Whittlesey**, first vice-president and director of sales and distribution, of the **Sherwin-Williams Co.**, Cleveland,

Ohio, on October 1, was relieved of the duties of director of sales and distribution, and in future will devote his entire time to executive duties and to the further interests of this company's allied connections. Mr. Whittlesey has served the company nearly 50 years. He spent 17 years in



K. H. Wood

charge of the eastern business at Newark, N. J., returning to Cleveland in 1918 in charge of all sales. **A. W. Steudel** who was vice-president is now vice-president and general manager of the company. Mr. Steudel has wide experience in practically all the operating and executive branches of the business, particularly in industrial sales, dyes, chemicals, pigments and colors. **K. H. Wood** who has had territorial and division sales experience and for several years has been in charge of railway and marine sales, is now director of sales and distribution of the company.

**William E. Crocombe**, president of the **American Forge Division** of the **American Brake Shoe & Foundry Company**, and president of the **American Manganese Steel Company**, has also been elected vice-president of the **American Brake Shoe & Foundry Company** with headquarters in Chicago. Mr. Crocombe started in the steel business as an office boy under Don H. Bacon of the



William E. Crocombe

Minnesota Iron Company, the Minnesota Steamship Company and the Duluth & Iron Range Railroad Company. When these companies were consolidated with the United States Steel Corporation, Mr. Cro-

combe entered the employ of the Illinois Steel Company in the rail mill and open hearth departments at the South Works. In 1907 he entered the employ of the Lackawanna Steel Company at Buffalo, N. Y., and from 1909 to 1915 was employed by the Union Drop Forge Company at Chicago. In the latter year he organized the forge department of the Ajax Forge Company, now the American Forge Division of the American Brake Shoe & Foundry Company. In 1924 he was elected president of the American Forge Company, now the American Forge Division of the American Brake Shoe & Foundry Company, and in 1933 was elected president of the American Manganese Steel Company.

**George H. Bucher** who was elected executive vice-president of the **Westinghouse Electric & Manufacturing Company**, with headquarters at Pittsburgh, Pa., is also president and general manager of the **Westinghouse Electric International Company**. Mr. Bucher has been connected with the Westinghouse organization since September 1, 1909. After graduating from Pratt Institute, Brooklyn, N. Y., having taken courses in both steam



George H. Bucher

and machine design and also electrical engineering, he joined the Westinghouse Electric & Manufacturing Company at East Pittsburgh as a graduate student. In 1911 he was transferred to the export department at New York and in 1920 he was appointed assistant to the general manager of the Westinghouse Electric International Company; in 1921 he was advanced to assistant general manager; in 1932 to vice-president and general manager. In 1934 Mr. Bucher was elected president and general manager of the same company and in 1935 he was elected to vice-president of the Westinghouse Electric & Manufacturing Company. Mr. Bucher is a member of the American Institute of Electrical Engineers and other associations.

**Herbert A. May**, who was recently elected vice-president of the **Union Switch & Signal Company**, as mentioned in the *Railway Age*, September 19, was born at Watertown, Wis., on June 27, 1892. His parents later moved to Pittsburgh, Pa., where he attended high school. He later entered Staunton Military Aca-

demy, Staunton, Va., from which he was graduated in 1910. He then joined the Atlantic Refining Company at Pittsburgh, Pa., and was with this company for a number of years. Mr. May enlisted in the 28th Division, 107th Field Artillery in July, 1917. In March, 1918, he was commissioned first lieutenant, field artillery,



Herbert A. May

and was assigned as instructor to Camp Zachery Taylor, Louisville, Ky., and in March, 1919, was mustered out of service with the rank of captain. He then entered the employ of the Union Trust Company at Pittsburgh. In 1923 he became vice-president and treasurer of the Standard Gauge Steel Company, Beaver Falls, Pa., which was later merged into the Union Drawn Steel Company of which he was appointed assistant treasurer and elected a director, remaining with this company until December, 1930. He then went with the Westinghouse Electric & Manufacturing Company, Pittsburgh, Pa., as assistant to the president, which office he held until July, 1934, when he was elected vice-president of the Safety Car Heating & Lighting Company, from which he resigned when elected vice-president of the Union Switch & Signal Company. In addition, Mr. May is a director in a number of industrial and other corporations.

## OBITUARY

**George L. Walters**, vice-president and treasurer of the Adams & Westlake Company, Chicago, died of a heart attack on October 1, while waiting at the Indian Hill suburban station of the Chicago & North Western for a Chicago-bound train. He had been with the Adams & Westlake Company for more than 40 years.

**Charles F. Henning**, a director and vice-president of the United States Gypsum Company, Chicago, died in Highland Park, Ill., on October 3, following injuries received in an automobile accident on October 1. Mr. Henning was born in 1881 and spent virtually his entire business career with the United States Gypsum Company. He came to the company as a construction engineer in 1908, following his graduation from Lewis Institute, and short periods of employment with other concerns. In 1916 he was appointed manager of the company's contracting department; in 1920, he was appointed assist-

ant general sales manager, and in 1921 he was appointed general sales manager. Shortly after he was elected vice-president and a director.

**Fred D. Kennedy**, who has been connected with the Westinghouse Electric & Manufacturing Company in various capacities for the last 45 years, died on September 28, in the Homeopathic Hospital, Pittsburgh, Pa. Mr. Kennedy was born at Burgettstown, Pa., on January 20, 1870, and learned his trade as a machinist with the Morgan Engineering Company of Alliance, Ohio. He entered the employ of Westinghouse Electric & Manufacturing Company in January, 1893. At first he was engaged in installing electrical machinery in power stations particularly in connection with street and interurban railway systems. Later he was made superintendent of railway motor and locomotive work and was closely identified with important railway installations, such as the New York, New Haven & Hartford, the Chicago, Milwaukee & St. Paul, and the Pennsylvania electrifications. Mr. Kennedy was an authority on the mechanical details of railway and locomotive equipment and as such has more recently been attached to the staff of the general works manager in a consulting capacity.

## Financial

**CENTRAL OF GEORGIA.—Receiver's Equipment Trust.**—The Interstate Commerce Commission has authorized the receiver of this company to guarantee \$400,000 of series S equipment trust certificates bearing 4 per cent and maturing in 15 annual payments beginning 1937. The issue is authorized for sale at par plus a premium of \$250 for the entire issue to Johnson, Lane, Space & Co. of Savannah, Ga.—the highest bidder.

**CHESAPEAKE & OHIO.—Preferred Stock.**—A stockholders' meeting will be held in Richmond, Va., on November 5, at which a vote will be taken on a proposal to authorize the issuance of preferred stock, by which earnings heretofore undistributed would be in part passed on to stockholders.

**CHICAGO & NORTH WESTERN.—Abandonment.**—Charles P. Megan, trustee, has applied to the Interstate Commerce Commission for authority to abandon the operation of trackage between Manning, Ia., and Harlan, 21.5 miles, and to operate over the tracks of the Chicago Great Western.

**CHICAGO & EASTERN ILLINOIS.—Equipment Trust Certificates.**—Charles M. Thomson, trustee, has applied to the Interstate Commerce Commission for authority to acquire 500 steel-sheathed 50-ton box cars and to issue 15-year 3½ per cent equipment trust certificates for 80 per cent of the amount. It is proposed to purchase the cars from the General American Transportation Company at \$2,700 each.

**GULF, MOBILE & NORTHERN.—N. O. G. N. Bonds.**—The Interstate Commerce

Commission has authorized the New Orleans Great Northern to issue \$700,000 of first mortgage 5 per cent, series B, bonds to be delivered at par to the Gulf, Mobile & Northern in partial reimbursement for expenditures.

**MISSOURI SOUTHERN.—R. F. C. Loan Extension.**—The Interstate Commerce Commission has authorized the extension for one year of the time of payment of a loan of \$33,000 by the Reconstruction Finance Corporation to this company which matured October 7.

**PENNSYLVANIA.—I. C. C. Examiner Recommends Against Acquisition of Truck Line.**—Grover L. Swink, of the Section of Finance of the Interstate Commerce Commission's Bureau of Motor Carriers, has recommended in a proposed report that the commission deny without prejudice the application of the Pennsylvania Truck Lines, Inc., for authority to acquire control of the Alko Express Lines, stating that the proposed acquisition by payment of \$136,610, an amount approximately \$85,769 in excess of the depreciated book value of Alco's physical property, would neither promote the public interest nor constitute a provident commitment of applicant's funds.

**SOUTHERN PACIFIC.—Acquisition.**—The Interstate Commerce Commission has authorized this company to acquire the Biola branch of the Fresno Traction Company extending from a connection with the Central Pacific at Biola Junction, Calif., to Biola, 8.7 miles.

**SOUTHERN PACIFIC.—Abandonment.**—This company has applied to the Interstate Commerce Commission for authority to abandon the Yaquina branch, from Altire, Ore., to Yaquina, 7.26 miles.

**SOUTHERN PACIFIC.—Ferry Abandonment.**—The Interstate Commerce Commission has authorized this company and the South Pacific Coast Railway to abandon a ferry across San Francisco bay between San Francisco and Alameda, approximately 3 miles.

**TEXAS & PACIFIC.—Acquisition.**—The Texas & Pacific Motor Transport Company has applied to the Interstate Commerce Commission for authority to purchase a portion of the certificate rights of the Johnson Motor Freight Lines, operating between Abilene, Tex., and Big Springs, and of the Fort Worth Warehouse & Storage Company.

## Average Prices of Stocks and of Bonds

	Oct. 6	Last week	Last year
Average price of 20 representative railway stocks..	57.78	55.71	34.10
Average price of 20 representative railway bonds..	84.46	83.13	72.20

## Dividends Declared

Carolina, Clinchfield & Ohio.—\$1.00, quarterly; Stamped Certificates, \$1.25, quarterly, both payable October 20 to holders of record October 10.  
Cleveland, Cincinnati, Chicago & St. Louis.—Preferred, \$1.25, payable October 31 to holders of record October 8.  
Richmond, Fredericksburg & Potomac.—7 Per Cent Guaranteed, \$3.50, semi-annually; 6 Per Cent Guaranteed, \$3.00, semi-annually, both payable November 2 to holders of record October 31.



# Railway Officers

## EXECUTIVE

**George S. Lee**, vice-president in charge of traffic for the Railway Express Agency at New York, whose retirement on Sep-



George S. Lee

tember 30 was noted in the *Railway Age* of October 3, was born in Ashtabula County, Ohio, on September 5, 1886. Mr. Lee entered railway service as baggage clerk with the Chicago, Burlington & Quincy at Lincoln, Neb. in 1887. In 1890 he went with Wells Fargo & Company at Lincoln and three years later became money clerk at St. Louis, Mo. In 1897 he became cashier at Kansas City, Mo.; chief traffic clerk in 1898; assistant traffic manager at New York in 1906; and traffic manager in 1911, all with Wells Fargo & Company. Mr. Lee was appointed traffic manager for the American Railway Express Company in 1918, and became vice-president in charge of traffic in January, 1929, continuing in that capacity upon the formation of the Railway Express Agency in March of that year.

**Calvin A. Frey**, whose appointment as vice-president in charge of traffic for the Railway Express Agency, with head-



Calvin A. Frey

quarters at New York, was noted in the *Railway Age* of October 3, has served

with the express companies for more than 32 years in various parts of the United States. Having had some experience during vacation periods, he obtained employment as deliveryman at his home town of Ottawa, Ohio, on graduation from high school. Subsequently, he served at Toledo, Ohio; Jackson, Mich. and Little Rock, Ark., later acting as agent at Newport, Ark., and Pine Bluff. Mr. Frey became special route agent in Arkansas and West Texas for Wells Fargo & Company and in March, 1912, was appointed chief clerk to the traffic manager of that company at Houston, Tex. In August, 1917, he was appointed assistant traffic manager at New York. During the war Mr. Frey was loaned to the United States Railroad Administration at Washington, D. C., as assistant to manager of express and mail section. In March, 1920, he returned to New York as assistant traffic manager for the American Railway Express. From 1920 to 1929, he was in charge of general and formal express rate cases before the Interstate Commerce Commission and the various State commissions and on special assignments for the vice-president in charge of traffic. Mr. Frey was appointed assistant to vice-president in charge of traffic in 1929, the position he held until his recent appointment.

**J. H. Butler**, general manager of the department of public relations of the Rail-



J. H. Butler

way Express Agency, has been appointed traffic executive, as noted in the *Railway Age* of October 3. Mr. Butler's entire business career of 41 years has been in the express service. He began as a clerk for the National Express Company at Chicago, Ill., later becoming superintendent of its Western division in that city. After a year as assistant to vice-president of the American Express Company, affiliated with the National, he became manager of the Loss and Damage department at New York, during the World War period. He continued in that position with the American Railway Express Company and in March, 1924, was appointed general manager of the Department of Public Relations, which he helped to organize. His work in this field was continued when the Railway Express Agency succeeded the previous company in March, 1929.

**J. M. Prickett**, superintendent of personnel of the Kansas City Southern, has been appointed assistant to the president, with headquarters as before at Kansas City, Mo. Mr. Prickett was born on January 21, 1887, at Ligonier, Ind., and first entered railway service as secretary to the superintendent of the Cincinnati, Ham-



J. M. Prickett

ilton & Dayton (now part of the Baltimore & Ohio), at Indianapolis, Ind. On April 1, 1906, he entered the service of the Kansas City Southern as secretary to the general manager at Kansas City, and with the abolition of the position of general manager in 1912, he became secretary to the general superintendent of transportation. In 1913 he became connected with the Baltimore & Ohio, as secretary to the general superintendent of transportation at Baltimore, Md., returning to the K. C. S. on June 1, 1914, as secretary to the president. In February, 1917, he was made chief clerk to the general manager and in July, 1918, he became chief clerk to the federal manager, whose supervision extended over the several lines in the Kansas City Southern group. When the railroads were returned to private ownership in March, 1920, Mr. Prickett became chief clerk to the president, and, with the establishment of the personnel department in January, 1923, he was appointed superintendent of personnel, having charge of employment, wages and working agreements.

## OPERATING

**Sir George McLaren Brown**, European general manager of the Canadian Pacific, with headquarters in London, will retire on October 31 under the company's pension rules after almost 50 years of service with this road and will be succeeded by **J. C. Pateson**, assistant to the European general manager. Entering the service of the Canadian Pacific in 1887, he reached the position of general traffic manager and executive representative for British Columbia within five years. Later he was appointed general superintendent of hotels, dining and sleeping cars, then general passenger agent for ocean services at Montreal. He was appointed to his present position as European general manager, with headquarters in London, in 1910.

**Edgar H. Major**, who has been appointed superintendent car service of the Louisville & Nashville, with headquarters at Louisville, Ky., as reported in the *Rail-*



Edgar H. Major

*way Age* of September 26, was born on January 18, 1891, at Hopkinsville, Ky. He entered the service of the L. & N. on June 7, 1907, at Earlington, Ky., where he served successively as storeroom clerk, record clerk, yard clerk, chief clerk and cashier. In March, 1911, he was transferred to Hopkinsville as cashier, and in April, 1912, he was sent to Birmingham, Ala., as a clerk in the agent's office. In August, 1915, Mr. Major left the L. & N., to accept a position with another line, returning to the L. & N. in May, 1916, as assistant agent at Copperhill, Tenn. In March, 1918, he was appointed chief accountant in the East End agent's office at Cincinnati, Ohio, where he was later appointed chief clerk. On July 1, 1920, he was appointed assistant car distributor in the office of the superintendent of transportation at Louisville, later being advanced to car distributor and then to chief clerk in the same office. He was holding the latter position at the time of his recent appointment as superintendent of car service.

## TRAFFIC

**H. N. Huse**, division freight agent for the Norfolk & Western, has been appointed chief of divisions bureau, with headquarters at Roanoke, Va. The position of division freight agent has been abolished.

**T. K. Earley**, assistant general freight agent of the Denver & Rio Grande Western, has been promoted to general freight agent with headquarters as above at Denver, Colo., to succeed **B. W. Robbins**, who retired on October 1 after more than 46 years of service with this company.

**Gayle W. Arnold**, district freight agent for the Baltimore & Ohio, with headquarters at Cincinnati, Ohio, has been appointed manager of the commercial development department, with headquarters at Baltimore, Md. **John H. Hague**, district freight representative, with headquarters at San Francisco, Cal., has been appointed district freight agent at Cincinnati, succeeding Mr. Arnold.

**G. S. Woodward**, commercial agent

for the Seaboard Air Line, with headquarters at Belle Glade, Fla., has been appointed district freight agent, with headquarters at West Palm Beach, Fla., succeeding **A. M. Baker**, who has been appointed district freight agent at Orlando, Fla. Mr. Baker succeeds **E. D. Mays**, whose appointment as assistant freight traffic manager at Tampa, Fla., was noted in the *Railway Age* of October 3.

**Robert S. Wheeler**, whose appointment as general traffic manager for the Railway Express Agency at New York was noted in the *Railway Age* of October 3, has had 34 years of experience in the express service. Mr. Wheeler went with the American Express Company in August, 1902, and was assigned to its accounting department. Four years later he was transferred to traffic work and subsequently became assistant to the traffic manager. During the World War period, when the express companies were merged



Robert S. Wheeler

into a single organization, Mr. Wheeler continued in that position. On March 1, 1929, when the Railway Express Agency succeeded the former operating company, he was appointed traffic manager, the position he held until his recent appointment as general traffic manager.

**C. F. Messenkopf**, whose appointment as traffic manager for the Railway Express Agency at New York was noted in the *Railway Age*, of October 3, has been



C. F. Messenkopf

34 years in the express service. He started as an office boy in the traffic department in April, 1902, and served in various positions until he was promoted to

assistant to the traffic manager, later becoming the vice-president's assistant. After a few years in New York City operations, Mr. Messenkopf returned to the traffic department in August, 1923, as aide to the traffic manager's assistant and in January, 1929, he became assistant traffic manager, the position he held at the time of his recent appointment.

## ENGINEERING AND SIGNALING

**W. H. B. Bevan**, assistant district engineer on the Central region of the Canadian National, with headquarters at Toronto, Ont., has been appointed division engineer of the Montreal, (Que.) Terminals, to succeed **G. H. Frith**, who has been appointed office engineer at Toronto.

## MECHANICAL

**H. B. Hilliker**, supervisor of floating equipment of the Delmarva division of the Pennsylvania, has been appointed superintendent of floating equipment for the New York Zone of the Pennsylvania and the Long Island, with headquarters at Jersey City, N. J., succeeding **W. R. Elsey**, who has been promoted to mechanical engineer of the Pennsylvania at Altoona, Pa.

**W. F. Kiesel, Jr.**, since 1919 mechanical engineer of the Pennsylvania, retired on October 1 after an unbroken service in the equipment engineering department of that road of over 48 years. Mr. Kiesel's connection with railway rolling stock design has included the entire period of the inception and development of steel freight and passenger cars. He played an important part in the development of both classes of equipment on the Pennsylvania and, in the case of freight cars, on the rolling stock of all American railroads. During this same period the steam locomotive passed through a no less remarkable evolution in capacity, in economy and in refinement of mechanical design. In motive-power developments Mr. Kiesel's ideas, backed up as they were with the results of the liberal use of the Altoona testing plant, exerted an equally important and widespread influence. Two of the more recent developments with which his name is associated are the limited cut-off and improvements in the design of front-end drafting devices. A measure of his contribution to the advancement of the art in his field is the fact that he has been granted a total of 135 patents on improvements in design of, or devices for locomotives and cars.

William Frederick Kiesel, Jr., was born at Scranton, Pa., September 1, 1866. He was graduated as a mechanical engineer from Lehigh University in 1887. Prior to and in vacations during his college course he served an apprenticeship in the machine shops of the Lackawanna Iron & Steel Company. On graduation he was for a short time engaged in locomotive testing on the Lehigh Valley. Mr. Kiesel began his service with the Pennsylvania in 1888; he was first a draftsman, then chief draftsman, assistant engineer, and assistant mechanical engineer. He occupied the later position from 1902 until 1919 when



# Look to MODERN POWER . . .



## for increased Profits

Turn the searchlight of practical experience on  
a few of the best of modern locomotives.

Observe their operating results » » » This modern  
power moves heavier trains at higher speeds

—it spreads operation costs over more tonnage

» » » With traffic increasing—both passenger and  
freight—the opportunity for increasing net  
earnings is immense.



LIMA LOCOMOTIVE WORKS, INCORPORATED, LIMA, OHIO

he became mechanical engineer, a post which he held until the date of his retirement. Mr. Kiesel was long active in the American Railway Master Mechanics'



W. F. Kiesel, Jr.

and the Master Car Builders' Associations and later in the Mechanical Division of the American Railway Association. He served as chairman of the committees on Main and Side Rods, Springs for Freight-Car Trucks, and Car Construction, having been occupied in the latter assignment from 1912 until 1927. He is a member of the American Society of Mechanical Engineers.

### SPECIAL

**Kinsey N. Merritt**, whose appointment as general sales manager for the Railway Express Agency was noted in the *Railway Age* of October 3, has had 28 years of service with the Railway Express Agency and predecessor companies. He began his career as a clerk in the Baltimore, Md., express office in October, 1908, and, after serving in various capacities,



Kinsey N. Merritt

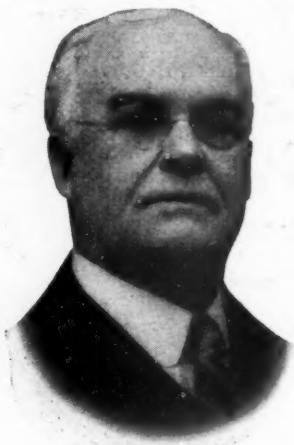
became chief clerk at Atlantic City, N. J., in November, 1915. He later became correspondent and route agent at Philadelphia, Pa., and Camden, N. J. In July, 1917, he was appointed assistant to the superintendent in charge of the Delaware-Chesapeake division, which position he held successively at Camden and Philadelphia. In March, 1930, Mr. Merritt was appointed

traffic agent for the Allegheny department attached to the staff of the general manager, and in October, 1932, he became assistant traffic manager at New York. In October, 1935, Mr. Merritt was appointed assistant general manager of the Department of Public Relations at New York, the positions he held until his recent appointment.

### OBITUARY

**Arthur L. Graburn**, who retired on May 31, 1935, as fuel agent for the Canadian National at Toronto, Ont., died on September 25 at the Ontario Club, Toronto.

**Frederick W. Brazier**, retired assistant to the general superintendent of motive power and rolling stock on the New York Central, died on October 4 at his home in Forest Hills, N. Y. Mr. Brazier was born on November 15, 1852, at Boston, Mass., and received his education in grammar school and Comers Business College, Bos-



Frederick W. Brazier

ton. He entered railway service in 1877 as a carpenter on the Fitchburg Railroad (now Boston & Maine) at Boston, Mass., serving in this capacity and in that of assistant foreman until 1885, when he became general foreman of the car department of that road. From 1893 to 1896, Mr. Brazier was superintendent of the Chicago, New York & Boston Refrigerator Company at Chicago. He served as general foreman of the car department of the Illinois Central at Chicago from January to October, 1896, and then became assistant superintendent of machinery for that road. From 1899 to 1904 he served as assistant superintendent rolling stock for the New York Central & Hudson River (now New York Central) and from 1904 to 1920 was superintendent rolling stock for the New York Central. Mr. Brazier served as assistant to general superintendent motive power and rolling stock for the New York Central from 1920 until his retirement in 1932. He was past president of the Master Car Builders' Association.

**George D. Ogden**, assistant vice-president in charge of traffic for the Pennsylvania, with headquarters at New York, died on October 4 at his home in Homer City, Pa. Mr. Ogden was born on May 16, 1868, at Homer City and received his

education at the Indiana Normal School and Washington and Jefferson College, Washington, Pa. He entered the service of the Pennsylvania in June, 1887, as freight and ticket agent at Homer City. From 1890 to 1901 he served successively as night yard clerk at Allegheny City, Pa.; transportation clerk in the superintendent's office, West Penn division; freight and ticket agent at Butler, Pa.; freight agent and yard master at McKeesport, Pa., and freight agent at Harrisburg, Pa. Mr. Ogden was appointed division freight agent at Altona, Pa., on January 14, 1901, and



George D. Ogden

was transferred to the Buffalo and Allegheny Valley division at Pittsburgh in the same capacity on June 1, 1903. He was promoted to assistant general freight agent at Philadelphia on March 1, 1906, serving in that position until May 8, 1912, when he was further advanced to general freight agent. Mr. Ogden was appointed freight traffic manager, lines east of Pittsburgh, in May, 1916, holding that position under the United States Railroad Administration. At the termination of government control of the railroads on March 1, 1920, Mr. Ogden was appointed traffic manager of the Central Region, with headquarters at Pittsburgh, being transferred in that capacity to Philadelphia on October 24, 1923. On July 16, 1929, he was appointed to assistant vice-president in charge of traffic at New York and on August 15, 1931, was appointed vice-president for New England at Boston, Mass. On May 16, 1933, Mr. Ogden was transferred back to New York as assistant vice-president in charge of traffic, the position he held at the time of his death. In October, 1917, Mr. Ogden organized the Traffic Emergency Committee to devise methods for avoiding congestion of war materials. In December of the same year, at the request of the General Operating Committee, Eastern Railroads, Railway War Board, he organized the Export division of that committee, and when the name was changed to the Freight Traffic Committee, North Atlantic Ports, during federal control, he continued as chairman until June, 1918. On the latter date, upon the creation of the Exports Control Committee Mr. Ogden was chosen chairman of that committee. Mr. Ogden was a member of the Railway Club of Pittsburgh, the Traffic Club of New York and the Traffic Club of New England.



**YOU CANNOT HAVE**

*Both*

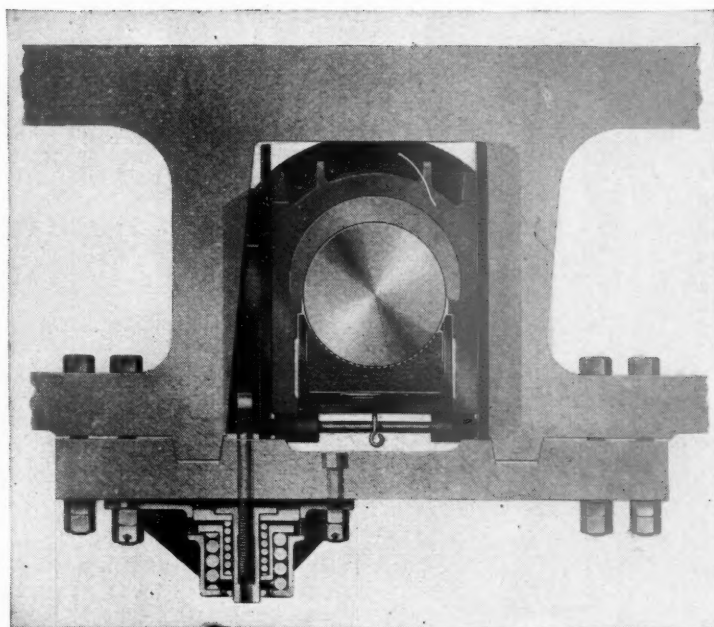
**WITH A**

**HAND ADJUSTED WEDGE**

With a surface bearing, driving box temperature varies as much as  $250^{\circ}$  over short periods of time. Driving box size varies correspondingly.

No matter how perfectly the driving box wedge may be adjusted by hand, it is either too loose when the box is cold or too tight when the box expands. It cannot be right for both.

Franklin Automatic Compensator and Snubber automatically compensates for temperature change as well as wear. The wedge member automatically eases downward as the box expands and upward as it cools. The correct adjustment is always automatically maintained. The snubber member yields only to unusual shocks which avoids all possibility of excessive strains.



Like its twin, the Type E-2 Radial Buffer, it is one of the most effective devices in maintaining proper adjustment, easy riding and low maintenance costs.



When maintenance is required a replacement part assumes importance equal to that of the device itself and should be purchased with equal care. Use only genuine Franklin repair parts in Franklin equipment.

**FRANKLIN RAILWAY SUPPLY COMPANY, INC.**

NEW YORK

CHICAGO

MONTREAL

# Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1936

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from railway operation	Net railway operating income	
		Freight	Passenger	Total	Way and structures	Maintenance of equipment	Traffic			Operating income	After depr. & retir. 1936
Akron, Canton & Youngstown.....Aug. 8 mos.	171	\$171,624	\$27	\$171,651	\$30,115	\$15,704	\$8,598	64.0	\$65,287	\$51,899	\$33,434
Alton.....Aug. 8 mos.	171	1,073,594	305	1,073,899	232,770	129,674	43,747	93.1	430,451	434,642	237,734
Alton.....Aug. 8 mos.	956	1,066,106	189,178	1,255,284	344,512	186,912	50,904	75.0	300,831	220,311	34,948
Alton.....Aug. 8 mos.	956	7,957,079	1,360,371	9,317,450	1,683,314	1,704,429	385,890	75.3	2,167,506	1,483,873	313,320
Atchison, Topeka & Santa Fe System.....Aug. 8 mos.	13,227	11,108,034	1,604,682	12,712,716	2,208,828	2,948,377	397,377	75.8	3,340,689	2,017,317	1,733,078
Atlanta & West Point.....Aug. 8 mos.	13,232	80,224,708	10,450,518	90,675,226	15,640,404	23,267,081	3,395,027	81.7	18,087,688	9,143,857	8,777,700
Atlanta & West Point.....Aug. 8 mos.	93	112,821	26,507	139,328	19,662	36,018	8,036	84.5	24,597	17,665	17,867
Atlanta & West Point.....Aug. 8 mos.	93	799,075	181,192	980,267	151,419	235,724	64,824	87.3	145,975	90,026	46,236
Western of Alabama.....Aug. 8 mos.	133	93,612	25,753	119,365	19,129	38,729	6,653	94.1	7,817	—915	—12,203
Atlanta, Birmingham & Coast.....Aug. 8 mos.	639	701,617	182,701	884,318	157,938	255,111	55,660	94.2	58,327	2,097	87,179
Atlanta, Birmingham & Coast.....Aug. 8 mos.	639	2,588,398	13,957	2,602,355	416,311	50,344	100,459	78.7	64,248	38,945	1,440
Atlanta, Birmingham & Coast.....Aug. 8 mos.	639	1,831,410	150,231	1,981,641	344,867	400,086	175,180	88.3	261,441	149,396	69,624
Atlantic Coast Line.....Aug. 8 mos.	5,108	2,204,160	393,498	2,597,658	381,476	664,167	114,783	86.0	407,904	232,904	273,737
Charleston & Western Carolina.....Aug. 8 mos.	5,135	20,756,920	4,986,738	25,743,658	3,150,417	5,473,341	1,014,148	77.2	6,637,652	3,387,652	2,573,546
Charleston & Western Carolina.....Aug. 8 mos.	342	170,837	2,053	172,890	23,644	27,894	56,727	67.8	57,108	35,108	30,768
Baltimore & Ohio.....Aug. 8 mos.	6,486	12,551,556	1,025,113	13,576,669	2,055,517	2,266,812	51,385	67.7	478,074	326,074	303,455
Baltimore & Ohio.....Aug. 8 mos.	6,486	94,690,742	7,336,760	101,027,502	16,111,782	25,365,527	3,100,400	69.3	4,412,443	3,569,074	3,115,696
Staten Island Rapid Transit.....Aug. 8 mos.	23	368,861	632,160	1,001,021	106,929	168,371	14,904	100.6	—5,877	—17,303	—29,932
Bangor & Aroostook.....Aug. 8 mos.	603	206,957	15,777	222,734	89,817	75,738	5,331	119.4	—46,462	—66,621	—80,553
Bessmer & Lake Erie.....Aug. 8 mos.	225	1,758,613	281,514	2,040,127	270,249	270,249	13,317	70.3	1,112,465	790,788	1,202,926
Boston & Maine.....Aug. 8 mos.	225	8,959,874	28,448	9,000,769	956,809	2,191,957	93,930	37.3	4,085,233	3,088,216	3,411,608
Brooklyn East, Dist. Term.....Aug. 8 mos.	1,988	2,634,205	697,948	3,332,153	461,815	512,582	76,377	70.1	1,153,512	874,476	703,701
Burlington, Rock Island.....Aug. 8 mos.	255	48,332	7,411	55,743	12,198	12,198	3,895	48.7	43,764	371,079	372,046
Cambria & Indiana.....Aug. 8 mos.	255	434,007	42,366	476,373	97,324	126,649	30,774	131.9	—19,390	—26,925	—34,452
Canadian Pacific Lines in Maine.....Aug. 8 mos.	233	1,286,969	121,428	1,408,397	333,707	335,007	77,393	92.3	115,033	42,905	119,681
Canadian Pacific Lines in Vermont.....Aug. 8 mos.	83	502,852	68,758	571,610	158,838	212,376	34,475	136.9	—24,748	—301,605	—49,835
Central of Georgia.....Aug. 8 mos.	1,926	1,027,537	136,624	1,164,161	172,891	273,223	52,658	85.1	191,153	87,965	91,603
Central of New Jersey.....Aug. 8 mos.	1,926	8,165,369	933,790	9,099,159	1,298,413	2,198,346	419,712	85.6	1,477,178	690,628	509,389
Central Vermont.....Aug. 8 mos.	453	426,224	46,152	472,376	108,242	119,456	14,584	98.9	5,614	—18,037	—122,130
Chesapeake & Ohio.....Aug. 8 mos.	3,106	11,180,929	2,311,563	13,492,492	1,932,894	2,429,000	185,523	49.3	6,063,068	4,763,251	4,758,426
Chicago & Eastern Illinois.....Aug. 8 mos.	931	1,028,620	133,387	1,162,007	179,427	213,348	54,571	74.7	331,379	256,379	110,126
Chicago & Illinois Midland.....Aug. 8 mos.	131	2,222,254	10,321	2,232,575	26,454	48,422	14,923	61.6	791,131	652,445	661,951
Chicago & North Western.....Aug. 8 mos.	8,355	6,736,671	1,218,343	7,955,014	1,400,669	1,725,639	210,699	76.2	2,094,911	1,497,890	1,126,615
Chicago, Burlington & Quincy.....Aug. 8 mos.	9,021	6,933,500	881,091	7,814,591	1,401,520	2,260,558	6,104,262	70.5	2,554,775	1,855,891	1,378,009
Chicago Great Western.....Aug. 8 mos.	1,512	1,606,976	47,424	1,654,400	225,835	271,163	569,149	63.4	646,195	565,975	319,641
Chicago, Indianapolis & Louisville.....Aug. 8 mos.	572	726,899	50,446	777,345	1,635,205	4,475,107	8,714,259	74.2	3,029,578	2,418,656	918,512
Chicago, Indianapolis & Louisville.....Aug. 8 mos.	572	5,525,299	396,600	5,921,899	628,884	1,607,976	227,304	80.6	1,288,945	973,396	150,522

Continued on next left-hand page





## ***“Tailor Made”***

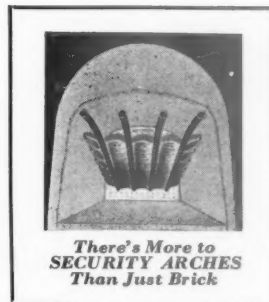
### **YET STANDARDIZED!**

Each Security Arch is “tailor made” to suit the individual class of power in which it must function. But so effectively is Security Arch Brick standardized that only six different Security Brick patterns are needed for more than 50% of the Security Arch Brick used.

This high standardization reflects the engineering and experience of the American Arch Company.

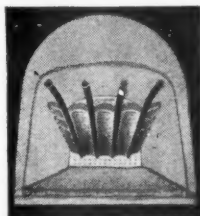
It simplifies the application of the brick arch and saves the stores department a vast amount of trouble.

This foresight of the American Arch Company in adhering to standards is but one of the many ways in which the American Arch Company is serving the railroads.



**HARBISON-WALKER  
REFRACTORIES CO.**

***Refractory Specialists***



**AMERICAN ARCH CO.  
INCORPORATED**

***Locomotive Combustion  
Specialists*** \* \* \*

# Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues				Operating expenses				Net from operation	Net railway operating income		
		Freight	Passenger (inc. misc.)	Total	Way and structures	Maintenance of equipment	Traffic	Portation	Total		Operating income	After depr. & retir.	Before depr. & ret.
Chicago, Mil., St. Paul & Pac.	11,128	\$8,515,258	\$773,691	\$9,288,949	\$2,185,362	\$1,593,657	\$231,731	\$3,442,702	\$7,797,231	\$2,367,951	\$1,630,951	\$1,027,458	\$1,472,581
Chicago, Rock Island & Pacific	11,127	\$8,931,391	4,804,673	13,736,064	12,479,627	13,014,527	1,682,199	26,689,276	56,520,008	13,661,294	8,181,294	4,076,098	7,652,259
Chicago, Rock Island & Pacific	7,576	5,257,694	594,219	5,851,913	1,039,796	1,459,548	209,284	2,441,476	5,546,491	918,267	453,599	147,279	501,201
Chicago, Rock Island & Pacific	7,575	39,041,397	4,525,126	43,566,523	6,537,412	11,682,710	1,587,742	20,394,675	43,332,902	4,977,661	1,279,550	-1,093,048	1,769,030
Chicago, Rock Island & Gulf	626	278,576	29,504	308,080	68,822	34,413	16,648	123,443	269,560	121,696	98,819	36,446	40,395
Chicago, St. Paul, Minn. & Omaha	1,648	1,596,938	170,206	1,767,144	442,782	278,776	128,820	1,018,899	2,078,734	794,526	617,241	190,588	222,921
Clinchfield Railroad	309	495,804	5,823	501,627	33,451	115,064	17,027	93,602	272,051	235,458	181,702	225,263	268,097
Colorado & Southern	956	5,582,909	36,069	5,618,978	309,787	927,748	139,294	788,248	2,280,424	571,171	1,712,484	1,640,432	1,987,840
Colorado & Southern	1,005	3,858,909	264,163	4,123,072	581,472	897,199	104,576	1,842,896	3,704,711	841,376	333,705	155,134	407,939
Ft. Worth & Denver City	902	443,168	68,371	511,539	52,507	75,785	17,949	154,520	337,462	179,068	143,540	107,746	125,053
Columbus & Greenville	167	623,717	49,979	673,696	350,581	671,505	143,846	1,211,399	2,663,068	70,715	831,458	586,275	727,167
Delaware & Hudson	830	1,736,752	145,858	1,882,610	268,225	484,385	45,007	720,952	1,644,724	331,054	187,441	191,219	281,558
Delaware, Lackawanna & Western	984	2,854,297	612,447	3,466,744	2,099,959	3,994,614	365,611	6,107,130	13,741,673	2,518,928	1,442,235	1,508,528	2,243,031
Denver & Rio Grande Western	2,584	2,099,846	177,314	2,277,160	487,809	569,609	55,154	809,553	1,980,335	407,652	211,824	96,257	192,125
Denver & Salt Lake	232	1,969,997	7,965	1,977,962	2,718,854	4,450,754	422,854	5,309,545	13,471,256	1,828,677	321,753	-165,402	604,114
Detroit & Mackinac	242	70,537	4,209	74,746	13,557	13,268	776	23,389	54,216	27,486	24,886	21,687	24,552
Detroit & Toledo Shore Lines	50	233,600	.....	233,600	.....	233,600	.....	.....	.....	.....	.....	.....	.....
Detroit, Toledo & Ironton	472	513,344	298	513,642	66,745	70,936	10,357	126,217	300,482	234,884	180,303	151,183	172,475
Duluth, Missabe & Northern	572	5,133,400	1,998	5,135,398	2,662,713	499,568	84,703	1,112,162	2,551,369	2,711,344	2,184,933	1,881,395	2,052,045
Duluth, Missabe & Northern	559	9,807,023	20,477	9,827,500	1,150,278	1,681,891	30,369	1,920,834	5,150,849	6,081,112	4,751,951	4,727,163	5,326,314
Duluth, Winnipeg & Pacific	178	111,927	2,931	114,858	24,436	16,173	1,789	41,365	88,148	30,973	22,687	4,892	7,917
Elgin, Joliet & Eastern	434	1,244,777	16,906	1,261,683	200,789	144,140	14,406	362,734	756,721	83,513	144,952	-46,569	-21,308
Erie	2,297	6,138,070	503,471	6,641,541	4,667,397	10,240,850	1,353,698	19,898,885	38,586,341	12,181,030	7,200,473	12,651,339	12,651,339
New Jersey & New York	45	127,582	381,792	509,374	40,790	121,975	5,084	389,597	572,023	-85,805	-214,819	-291,294	-214,731
New York, Susque. & Western	215	210,842	24,818	235,660	25,175	37,083	4,673	110,642	190,739	54,938	29,839	-6,004	-444
Florida East Coast	712	2,018,498	194,245	2,212,743	211,411	286,800	38,073	1,007,251	1,651,934	639,792	469,416	241,322	287,158
Fort Smith & Western	249	446,474	8,165	454,639	123,464	68,602	43,972	159,697	421,418	12,882	11,882	4,379	4,945
Georgia Railroad	329	2,064,825	114,817	2,179,642	318,049	60,600	17,547	124,886	248,147	382,489	331,924	399,756	480,831
Georgia & Florida	408	165,660	4,147	169,807	28,459	20,191	9,014	44,515	108,001	65,565	58,170	52,633	57,911
Grand Trunk Western	1,032	1,117,739	603,408	1,721,147	1,947,257	2,946,707	282,992	6,151,815	12,021,390	3,811,711	2,951,441	2,115,178	2,868,609
Canadian Nat'l Lines in New Eng.	172	102,349	11,499	113,848	38,692	15,777	2,436	56,935	123,512	15	-15,457	-38,478	-35,476
Great Northern	8,220	47,345,050	3,347,681	50,692,731	5,775,091	9,253,873	1,438,716	16,532,712	37,063,430	18,356,788	13,256,364	12,649,754	15,099,147

Continued on next left-hand page



# GREATER Steaming Capacity

## *Hauls More Tonnage*

The ability of a locomotive to haul its tonnage and maintain the schedule is directly proportionate to its steaming capacity.

The Elesco feed water heater will increase the steaming capacity of a locomotive 12%-15% with a proportionate increase in the gross ton miles per hour.

5,000 locomotives in the United States and Canada have increased their hauling capacity through the application of Elesco feed water heaters.



A-1093

**THE  
SUPERHEATER  
COMPANY**

*Representative of American Throttle Company, Inc.*

60 East 42d Street, New York  
Peoples Gas Bldg., Chicago

Canada: The Superheater Co., Ltd., Montreal

Tangential Steam Dryers   Superheaters   Feed Water Heaters   Exhaust Steam Injectors   Superheated Steam Pyrometers   American Throttles

# Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues—(for—)			Operating expenses—			Operating ratio	Net from operation	Net railway operating income		
		Freight	Passenger	(Inc. misc.)	Maintenance of way and structures	Traffic	Trans- portation			Operating income	After deprec. & retir. 1936	Before deprec. & retir. 1935
Green Bay & Western.....Aug.	234	\$121,688	\$1,065	\$129,429	\$35,952	\$5,760	\$43,030	78.9	\$102,121	\$16,072	\$7,477	\$16,944
Gulf & Ship Island.....Aug.	234	1,004,744	6,755	1,056,200	121,218	46,795	35,912	75.5	797,991	179,482	121,665	98,914
Gulf & Ship Island.....Aug.	259	100,846	10,720	123,436	21,115	2,487	56,631	89.7	110,698	12,738	12,621	5,302
Gulf & Ship Island.....Aug.	259	792,078	70,760	964,214	147,280	27,144	474,719	86.6	834,711	9,247	69,505	58,877
Gulf, Mobile & Northern.....Aug.	936	605,567	31,965	659,411	65,832	36,186	156,406	57.72	380,579	219,832	154,756	108,886
Illinois Central.....Aug.	936	4,298,797	200,328	4,499,125	800,604	285,567	1,238,819	63.22	2,961,201	1,331,333	844,334	596,065
Illinois Central.....Aug.	4,972	6,745,819	834,418	8,141,425	1,007,577	216,843	2,951,089	77.5	1,828,170	1,195,036	954,252	1,499,618
Illinois Central.....Aug.	4,975	52,109,567	5,966,929	63,198,472	5,882,453	1,824,158	24,029,713	77.9	13,979,944	9,108,573	7,363,450	5,859,291
Yazoo & Mississippi Valley.....Aug.	1,619	1,143,551	95,767	1,313,903	119,897	31,542	464,456	67.3	430,275	292,922	199,538	52,813
Illinois Central System.....Aug.	1,619	8,137,791	566,797	9,132,060	798,914	266,928	3,627,818	71.7	2,634,243	1,584,365	876,455	1,219,779
Illinois Central System.....Aug.	6,592	7,889,370	930,185	9,055,328	945,173	248,385	3,415,545	76.1	2,258,845	1,187,518	1,160,328	527,337
Illinois Central System.....Aug.	6,594	60,247,358	6,533,726	72,530,332	6,681,367	2,091,086	27,637,531	77.1	16,624,217	10,680,196	8,310,202	5,865,402
Illinois Terminal.....Aug.	508	373,551	72,128	494,489	52,197	15,033	153,353	62.40	308,589	143,428	127,533	107,567
Kansas City Southern.....Aug.	512	3,007,700	549,267	3,872,033	401,821	127,782	1,267,027	63.95	1,403,299	959,792	681,229	1,112,002
Kansas City Southern.....Aug.	878	1,111,444	21,298	1,246,771	111,362	46,106	329,886	59.5	398,584	314,340	176,614	343,638
Kansas City Southern.....Aug.	878	7,887,362	144,076	8,861,089	765,951	332,594	2,464,364	62.2	2,643,050	2,114,602	1,734,892	2,345,668
Kansas Oklahoma & Gulf.....Aug.	326	227,024	662	230,464	34,992	7,977	46,013	46.9	108,161	97,553	73,001	60,007
Lake Superior & Ishpeming.....Aug.	326	1,612,733	4,242	1,638,051	209,841	52,419	359,146	47.6	858,086	690,692	531,111	324,411
Lake Superior & Ishpeming.....Aug.	160	365,230	130	421,345	37,017	964	54,653	27.8	304,203	242,983	241,504	205,023
Lake Superior & Ishpeming.....Aug.	160	1,562,119	783	1,783,674	226,278	5,157	298,688	44.1	997,578	708,228	697,262	392,113
Lehigh & Hudson River.....Aug.	96	119,431	86	120,430	10,744	3,766	45,440	68.2	82,114	25,801	13,980	15,431
Lehigh & Hudson River.....Aug.	96	1,012,580	88	1,019,705	119,582	29,077	384,620	72.5	280,808	181,762	84,472	127,132
Lehigh & Hudson River.....Aug.	218	3,037,114	260	3,108,388	31,678	6,021	110,724	73.5	82,196	58,533	35,750	83,114
Lehigh & Hudson River.....Aug.	219	2,583,007	2,266	2,606,390	272,113	49,390	1,934,403	74.2	671,987	513,319	510,296	605,825
Lehigh Valley.....Aug.	1,331	3,372,308	231,822	3,850,141	202,850	113,368	1,579,899	70.0	1,153,336	939,141	777,919	115,588
Louisiana & Arkansas.....Aug.	1,334	27,584,263	1,743,531	31,417,083	1,947,224	899,333	13,574,204	73.7	8,271,478	6,620,825	5,250,491	2,767,720
Louisiana & Arkansas.....Aug.	606	4,550,299	10,494	4,884,378	61,431	60,472	116,070	59.6	195,731	132,999	154,318	147,277
Louisiana & Arkansas.....Aug.	606	3,546,205	79,364	3,763,668	505,290	223,885	928,677	61.4	1,451,525	1,112,971	936,984	684,086
Louisiana, Arkansas & Texas.....Aug.	255	106,328	423	113,932	28,438	4,605	32,321	69.8	79,498	27,532	9,619	3,103
Louisville & Nashville.....Aug.	255	804,944	2,108	847,078	219,352	37,999	260,473	74.8	213,122	177,476	49,429	16,869
Louisville & Nashville.....Aug.	4,981	6,281,001	625,935	7,358,728	732,473	176,951	2,389,567	71.1	2,125,707	1,612,286	1,030,581	2,041,724
Louisville & Nashville.....Aug.	4,999	48,989,763	4,263,437	57,290,203	5,894,423	1,446,161	19,334,840	73.9	14,958,413	11,271,338	8,250,052	14,237,302
Maine Central.....Aug.	1,046	760,083	120,940	976,934	174,758	12,035	349,039	71.2	281,776	216,052	170,092	135,072
Midland Valley.....Aug.	1,046	6,554,496	660,612	7,925,400	1,469,077	92,340	3,031,443	79.1	1,656,531	1,138,137	683,015	1,088,205
Midland Valley.....Aug.	351	136,071	8	136,120	20,583	2,317	30,305	49.9	69,192	59,666	50,023	32,156
Midland Valley.....Aug.	355	942,948	111	957,765	105,494	18,540	239,791	55.8	422,899	354,419	291,613	308,631
Minneapolis & St. Louis.....Aug.	1,530	837,601	12,796	889,809	116,638	39,362	299,632	69.2	274,138	232,417	167,488	195,397
Minn., St. Paul & S. S. Marie.....Aug.	1,590	5,546,148	96,339	5,930,297	743,590	287,839	2,407,192	79.4	1,221,457	886,337	500,316	212,416
Minn., St. Paul & S. S. Marie.....Aug.	4,296	2,314,786	176,716	2,724,978	304,995	56,724	911,787	64.6	964,409	582,062	382,062	683,514
Minn., St. Paul & S. S. Marie.....Aug.	4,296	15,098,527	884,762	17,376,597	2,374,378	478,518	7,051,109	79.3	3,599,656	2,292,239	1,194,366	2,009,483
Duluth, South Shore & Atlantic.....Aug.	550	245,117	19,076	292,781	34,690	4,390	91,359	60.4	115,920	102,608	91,622	38,655
Duluth, South Shore & Atlantic.....Aug.	550	1,669,421	97,576	1,937,631	271,359	34,710	684,687	68.1	618,579	526,809	456,944	250,680
Duluth, South Shore & Atlantic.....Aug.	163	83,627	1,553	91,358	20,022	1,845	23,466	62.5	34,262	29,084	25,051	18,109
Duluth, South Shore & Atlantic.....Aug.	163	450,532	11,650	507,135	111,714	14,947	168,719	75.1	126,379	88,489	58,621	10,956
Mississippi Central.....Aug.	150	80,323	1,705	84,515	15,533	6,797	21,313	71.6	23,971	20,152	16,015	8,600
Mississippi Central.....Aug.	150	568,255	10,223	597,142	90,300	54,814	161,228	74.3	153,637	124,639	96,075	20,793
Mississippi Central.....Aug.	364	77,175	1,665	83,891	25,917	5,077	29,412	91.7	6,977	3,759	5,316	4,440
Mississippi Central.....Aug.	364	614,022	10,367	670,389	157,711	36,847	224,846	80.3	131,766	110,097	42,589	49,259
Missouri-Illinois.....Aug.	208	78,979	880	81,979	11,576	2,559	31,391	88.2	9,699	6,814	5,896	2,102
Missouri-Illinois.....Aug.	208	691,863	5,115	710,934	155,887	19,921	239,857	77.5	159,729	115,203	34,495	32,436
Missouri-Illinois.....Aug.	3,293	2,279,878	230,098	2,737,761	349,886	113,078	886,188	70.4	808,568	610,959	396,088	256,520
Missouri-Illinois.....Aug.	3,293	16,818,802	1,504,133	20,133,011	2,588,436	935,061	7,013,457	76.6	4,708,404	3,290,451	1,633,082	2,489,698
Missouri Pacific.....Aug.	7,216	6,710,851	515,928	7,854,240	1,160,454	239,193	2,623,088	73.9	2,050,427	1,603,198	1,078,799	508,506
Gulf Coast Lines.....Aug.	7,227	49,701,129	3,288,140	57,742,804	7,779,023	1,927,013	20,634,121	76.4	13,624,121	10,165,660	6,236,169	2,332,764
Gulf Coast Lines.....Aug.	1,763	777,361	43,467	874,546	148,741	48,789	297,845	82.94	149,157	82,714	22,309	55,785
Gulf Coast Lines.....Aug.	1,763	7,394,259	278,634	8,103,648	1,270,122	357,463	2,557,228	74.56	2,061,928	1,550,996	683,178	312,392

Continued on next left-hand page





**F**OR high speed passenger service over long runs, with due consideration for the comfort and safety of the traveler, and economy for the operating company, the American Locomotive Company is more convinced than ever that the modern steam locomotive is best suited to the principles demanded by good railroading. » » » »

**ALCO**

AMERICAN LOCOMOTIVE COMPANY

30 CHURCH ST., NEW YORK, N.Y.

# Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Maintenance of way and equipment			Operating expenses			Operating ratio	Net from operation	Net railway operating income		
		Freight	Passenger (inc. misc.)	Total	Structures	Equip-ment	Total	Traffic	Portation	Total			Operating income	After depr. & retir. 1936	Before depr. & ret. 1935
International-Great Northern	Aug. 1,154	\$820,617	\$102,116	\$1,029,603	\$145,358	\$199,185	\$344,543	\$30,604	\$407,918	\$837,729	81.36	\$191,874	\$138,866	\$49,017	\$81,192
Mobile & Ohio	Aug. 1,154	6,429,760	579,266	7,009,026	1,134,566	1,569,066	2,703,632	243,925	3,245,453	6,389,081	85.12	1,158,998	731,005	427,993	235,764
Montour	Aug. 1,201	6,148,132	232,380	6,380,512	846,054	1,471,562	2,317,616	328,647	2,646,263	5,431,048	80.5	2,111,965	930,826	518,775	929,303
Monongahela	Aug. 171	337,653	883	340,599	41,597	30,494	72,091	417	68,179	143,421	42.1	197,178	173,884	99,438	105,016
Montour	Aug. 173	2,974,064	7,371	2,981,435	299,745	234,296	534,041	3,398	626,372	1,189,931	39.7	1,808,184	1,631,095	982,931	1,028,740
Nashville, Chatt. & St. Louis	Aug. 154	7,388,833	729,879	8,118,712	1,182,471	2,187,732	3,370,203	909	47,561	3,377,764	44.7	129,271	101,410	121,236	132,274
Nevada Northern	Aug. 165	40,071	618	40,689	45,163	8,834	54,000	800	8,192	7,987	59.9	18,076	9,575	109,297	18,478
New York Central	Aug. 11,214	20,917,511	5,612,962	26,530,473	3,631,047	6,095,747	9,726,794	562,182	10,545,856	22,234,995	74.3	7,703,324	5,552,122	4,379,509	5,733,944
Pittsburgh & Lake Erie	Aug. 233	1,879,351	72,269	1,951,620	230,000	296,468	526,468	25,081	567,497	1,453,673	72.7	3,103,228	1,954,997	3,312,961	4,516,473
New York, Chicago & St. Louis	Aug. 1,704	3,389,081	105,166	3,494,247	383,588	512,880	896,468	113,689	1,008,707	2,256,995	62.3	1,365,046	1,109,985	821,437	949,757
New York, New Haven & Hartford	Aug. 2,038	25,180,722	640,250	25,820,972	2,573,830	3,850,497	6,424,327	907,443	8,817,308	17,154,221	64.3	9,540,308	7,939,736	5,711,354	6,741,167
New York Connecting	Aug. 20	223,746	.....	223,746	13,824	7,235	21,059	.....	26,825	48,917	20.9	185,077	149,987	128,560	128,560
New York, Ontario & Western	Aug. 566	1,567,667	143,809	1,711,476	185,985	263,721	449,706	12,911	297,826	561,315	73.5	1,201,503	1,152,171	1,033,444	1,280,229
Norfolk & Western	Aug. 2,166	7,828,034	232,773	8,060,807	1,035,283	1,347,750	2,383,033	116,842	1,662,818	4,332,328	52.3	3,935,540	2,599,327	2,885,172	3,262,092
Norfolk Southern	Aug. 834	333,727	16,344	350,071	72,151	49,988	122,139	21,283	133,061	296,917	82.9	26,920,373	18,454,365	20,500,273	23,502,307
Northern Pacific	Aug. 6,727	5,059,274	438,197	5,497,471	486,146	8,592,131	13,222,592	153,122	2,075,190	4,338,987	71.5	1,731,526	1,151,090	1,389,863	1,648,131
Northwestern Pacific	Aug. 351	1,598,826	604,692	2,203,518	340,318	428,181	768,499	32,993	1,215,274	2,126,360	87.3	310,138	225,373	170,371	281,691
Oklahoma City-Atoka	Aug. 132	37,208	476	37,684	40,483	3,790	44,273	799	11,327	26,529	65.5	13,954	9,406	3,055	3,062
Pennsylvania	Aug. 10,371	28,701,239	5,821,593	34,522,832	3,397,692	7,735,092	11,132,784	648,000	12,450,444	26,142,247	69.1	11,664,838	8,345,928	7,577,703	9,475,656
Long Island	Aug. 396	512,685	1,902,721	2,415,406	96,166	404,180	500,346	27,300	977,579	1,585,431	62.6	948,481	553,355	374,470	156,529
Pennsylvania-Reading Seashore Lines	Aug. 412	4,305,135	11,984,368	16,289,503	1,184,395	2,978,247	4,162,642	153,789	7,747,569	12,605,498	73.9	4,442,670	2,318,812	1,041,445	517,308
Pere Marquette	Aug. 2,115	18,974,317	651,950	19,626,267	2,328,707	4,352,654	6,680,361	515,927	7,486,408	15,462,110	71.5	5,291,191	3,998,323	3,227,539	3,481,073
Pittsburg & Shawmut	Aug. 103	324,237	2,440	326,677	31,791	8,420	40,211	9,887	114,287	363,376	109.2	30,734	40,926	21,222	25,256
Pittsburgh & West Virginia	Aug. 138	309,591	.....	309,591	27,465	74,067	101,532	16,921	60,875	233,758	71.6	92,913	66,508	92,655	114,261
Pittsburg, Shawmut & Northern	Aug. 190	2,345,328	.....	2,345,328	58,087	564,394	622,481	132,419	485,940	1,662,615	67.0	819,676	625,511	869,173	1,046,534
Reading	Aug. 1,456	4,199,406	321,022	4,520,428	342,779	813,988	1,156,767	10,979	247,827	590,712	88.3	78,234	60,189	12,505	3,978
Richmond, Fredericksburg & Potomac	Aug. 117	2,546,506	1,481,583	4,028,089	474,427	995,769	1,470,196	74,138	1,719,568	3,165,991	69.2	1,546,092	1,140,670	1,205,034	1,467,567
Rutland	Aug. 407	202,103	40,718	242,821	45,476	54,920	100,396	84,344	1,118,131	2,656,692	85.4	45,353	31,918	31,838	43,299
St. Louis-San Francisco	Aug. 4,928	3,554,720	2,170,339	5,725,059	436,463	7,340,845	11,787,308	112,104	1,455,149	3,344,357	78.8	135,578	581,285	598,301	123,136
		25,592,300	2,170,339	27,762,639	4,496,338	7,340,845	12,137,183	904,447	11,093,628	25,237,215	83.0	5,162,315	2,794,573	2,902,640	3,066,375

Continued on next left-hand page





## EXPERIENCE DICTATES the use of CAR RETARDERS

Five years experience on sixteen roads, during which gratifying returns on the investment were made, indicate that "Union" Electro-Pneumatic Car Retarders increase the opportunities for large savings and improved safety in the operation of classification yards. The savings mentioned were made under abnormally low traffic conditions and in the five years paid their installation cost one and one-half times. These savings included large

reductions in the cost per car classified, elimination of switching at other points and other operating and economic advantages. » » » » »

The combination of increasing freight traffic and noteworthy improvements in the "Union" Electro-Pneumatic Car Retarder, details of which are available at our nearest office, now makes possible larger savings and operating advantages than previously. » » » » »



1881

Union Switch &amp; Signal Co.

1936

SWISSVALE, PA.

NEW YORK

MONTREAL

CHICAGO

ST. LOUIS

SAN FRANCISCO

# Revenues and Expenses of Railways

MONTH OF AUGUST AND EIGHT MONTHS OF CALENDAR YEAR 1936—CONTINUED

Name of road	Av. mileage operated during period	Operating revenues			Operating expenses			Operating ratio	Net from operation	Net railway operating income		
		Freight	Passenger	Total	Way and structures	Equip-ment	Traffic			Operating income	After depr. & retir.	Before depr. & retir.
		(inc. misc.)								1936	1935	
Ft. Worth & Rio Grande.....	Aug. 233	\$27,208	\$1,645	\$28,853	1,761,607	7,768	\$1,869	118.6	\$6,922	\$11,083	\$17,204	\$17,153
St. Louis, San Francisco & Texas.....	Aug. 233	2,694,948	7,866	2,702,814	1,117,475	64,446	17,280	128.1	37,252	121,153	178,835	178,460
St. Louis, San Francisco & Texas.....	Aug. 261	123,854	1,513	125,367	3,681	15,021	5,907	87.8	9,523	8,644	21,861	21,729
St. Louis, San Francisco & Texas.....	Aug. 261	830,717	6,334	837,051	303,847	111,847	44,801	102.5	21,720	69,914	325,793	324,724
St. Louis Southwestern Lines.....	Aug. 1,749	1,484,456	33,607	1,518,063	213,402	263,761	73,242	68.8	492,260	393,776	249,260	299,557
Seaboard Air Line.....	Aug. 1,775	11,767,607	172,269	12,940,876	1,471,763	1,961,577	604,968	67.9	3,979,530	3,246,524	1,951,211	2,355,394
Seaboard Air Line.....	Aug. 4,307	2,141,365	316,091	2,457,456	450,237	2,457,456	1,245,875	90.9	1,245,875	1,245,875	1,245,875	1,245,875
Seaboard Air Line.....	Aug. 4,307	19,032,407	3,133,015	22,165,422	3,589,846	5,284,719	1,404,641	85.3	3,626,792	2,001,792	1,306,439	2,559,684
Southern Ry. ....	Aug. 6,641	6,669,660	958,212	7,627,872	1,470,554	1,470,554	149,434	67.7	2,680,622	2,200,833	1,924,041	2,193,939
Alabama Great Southern.....	Aug. 6,641	49,856,697	6,333,413	56,190,110	11,277,686	11,277,686	1,194,404	71.8	17,308,872	13,706,197	11,420,840	13,557,424
Alabama Great Southern.....	Aug. 315	476,398	61,726	538,124	124,632	124,632	12,854	73.1	133,351	116,951	103,704	107,093
Alabama Great Southern.....	Aug. 315	3,495,707	393,812	3,889,519	687,932	917,135	92,512	75.6	1,023,598	717,827	545,255	731,469
Cinn., New Orleans & Texas Pac.....	Aug. 336	1,270,728	102,653	1,373,381	175,924	292,163	30,495	60.3	575,551	440,106	413,855	464,211
Georgia Southern & Florida.....	Aug. 336	9,579,826	788,474	10,368,300	1,385,465	2,026,045	211,025	60.4	4,348,019	3,452,426	3,183,912	3,583,933
Georgia Southern & Florida.....	Aug. 397	143,983	25,646	169,629	31,060	44,618	1,702	84.3	29,268	16,743	9,615	16,785
Georgia Southern & Florida.....	Aug. 397	1,028,994	339,760	1,368,754	250,954	320,711	14,811	86.3	209,113	108,824	35,484	92,173
New Orleans & Northeastern.....	Aug. 204	201,643	21,745	223,388	26,770	41,118	6,013	64.9	84,007	59,660	37,689	43,858
Northern Alabama.....	Aug. 204	1,463,888	149,384	1,613,272	229,152	276,124	44,082	68.4	549,196	362,246	188,689	237,621
Northern Alabama.....	Aug. 100	50,478	2,289	52,767	4,092	1,238	1,018	46.3	29,370	25,570	12,570	979
Northern Alabama.....	Aug. 100	423,478	14,852	438,330	80,668	11,344	9,577	56.2	198,384	166,652	71,387	71,949
Southern Pacific.....	Aug. 8,772	10,449,947	2,007,079	12,457,026	1,238,778	2,059,068	319,977	70.4	4,002,030	3,222,754	2,541,822	3,017,133
Southern Pacific Steamship Lines.....	Aug. 8,772	73,984,056	95,196,792	169,180,848	9,426,503	16,289,307	2,493,152	73.7	24,992,667	18,132,153	13,220,035	17,056,038
Southern Pacific Steamship Lines.....	Aug. ....	450,391	34,342	484,733	15,581	105,902	16,163	97.4	13,200	10,336	15,506	45,432
Southern Pacific Steamship Lines.....	Aug. ....	3,424,410	159,837	3,584,247	137,724	731,727	135,275	102.3	84,823	123,755	125,769	157,059
Texas & New Orleans.....	Aug. 4,430	2,785,208	343,993	3,129,201	510,898	685,849	122,782	79.0	715,138	511,530	378,228	512,883
Spokane, Portland & Seattle.....	Aug. 4,430	21,612,442	2,229,043	23,841,485	3,704,009	5,201,484	8,941,333	79.6	5,478,590	3,406,971	2,014,321	3,131,690
Spokane, Portland & Seattle.....	Aug. 946	1,151,500	72,106	1,223,606	83,167	89,129	9,222	58.7	1,387	274,209	199,442	212,124
Spokane, Portland & Seattle.....	Aug. 946	4,336,393	386,233	4,722,626	652,186	639,388	73,342	67.2	1,681,067	1,124,272	698,234	830,217
Tennessee Central.....	Aug. 286	206,347	5,153	211,500	22,514	29,555	5,433	69.0	68,889	51,224	34,647	40,618
Texas & Pacific.....	Aug. 286	1,460,773	42,991	1,503,764	276,628	229,587	44,755	72.3	440,611	375,206	273,782	321,587
Texas & Pacific.....	Aug. 1,949	1,920,562	288,846	2,209,408	281,696	436,599	83,729	67.3	783,009	588,895	435,234	532,300
Texas & Pacific.....	Aug. 1,949	14,643,502	1,714,603	16,358,105	1,994,716	3,321,298	613,032	69.2	5,470,048	3,275,406	2,816,834	4,053,660
Texas Mexican.....	Aug. 162	93,930	550	94,480	107,453	15,339	3,067	69.5	32,728	26,440	21,423	23,266
Toledo, Peoria & Western.....	Aug. 162	782,090	3,696	785,786	139,685	121,977	26,074	72.2	241,804	194,009	144,257	158,971
Toledo, Peoria & Western.....	Aug. 239	206,429	2	206,431	14,945	14,945	1,111	78.6	44,733	34,644	15,733	27,886
Toledo, Peoria & Western.....	Aug. 239	1,577,598	59	1,577,657	443,732	105,324	375,768	71.1	461,905	360,712	216,369	310,097
Union Pacific System.....	Aug. 9,918	11,532,674	1,683,068	13,215,742	1,627,926	2,686,781	295,705	68.5	4,520,615	3,362,745	2,481,578	3,024,977
Utah.....	Aug. 9,918	76,068,459	9,776,515	85,844,974	11,727,876	19,083,700	2,607,624	75.5	22,973,040	14,358,332	9,642,933	13,946,584
Utah.....	Aug. 111	56,785	.....	56,785	15,342	18,677	475	93.7	3,566	3,566	477	10,304
Utah.....	Aug. 111	616,826	.....	616,826	115,478	175,135	3,636	78.1	135,769	69,829	68,891	147,476
Virginian.....	Aug. 619	1,416,633	5,196	1,421,829	116,307	257,457	251,272	45.6	800,168	700,168	757,788	851,573
Wabash.....	Aug. 619	10,566,908	31,181	10,598,089	847,518	1,991,697	148,901	46.5	5,894,889	4,929,889	4,530,487	5,092,954
Wabash.....	Aug. 2,447	3,196,110	213,218	3,409,328	494,788	595,387	1,379,281	75.5	899,724	685,959	389,684	566,530
Wabash.....	Aug. 2,447	26,180,659	1,625,622	27,806,281	3,632,714	5,518,235	1,137,177	76.1	7,157,274	5,563,191	3,237,035	4,658,821
Ann Arbor.....	Aug. 293	304,493	6,109	310,602	31,549	75,056	11,992	79.1	70,441	52,964	41,658	61,619
Western Maryland.....	Aug. 293	2,457,008	28,307	2,485,315	234,368	580,759	95,626	81.8	471,762	334,306	240,247	400,940
Western Maryland.....	Aug. 882	1,303,046	12,550	1,315,596	219,430	246,362	35,231	64.6	476,068	375,786	321,649	470,780
Western Maryland.....	Aug. 882	10,165,473	64,247	10,229,720	1,385,343	2,237,176	293,270	66.2	3,344,861	2,774,861	2,846,634	3,606,780
Western Pacific.....	Aug. 1,207	1,345,997	47,359	1,393,356	358,731	276,249	54,184	86.9	186,718	98,229	47,523	98,394
Wheeling & Lake Erie.....	Aug. 1,207	8,218,818	291,790	8,510,608	1,831,020	2,259,554	456,601	96.2	329,813	314,108	879,902	1,092,506
Wheeling & Lake Erie.....	Aug. 511	1,345,452	2,628	1,348,080	208,814	289,660	405,145	66.5	29,879	345,040	394,827	462,075
Wheeling & Lake Erie.....	Aug. 511	9,307,077	14,763	9,321,840	1,400,652	2,344,176	243,049	72.3	2,744,668	1,735,001	2,014,370	2,710,073
Wichita Falls & Southern.....	Aug. 203	44,639	55	44,694	10,254	5,264	1,524	69.60	15,156	12,158	9,556	11,572
Wichita Falls & Southern.....	Aug. 203	312,529	843	313,372	71,259	46,824	12,819	74.26	9,3175	67,830	50,473	63,866